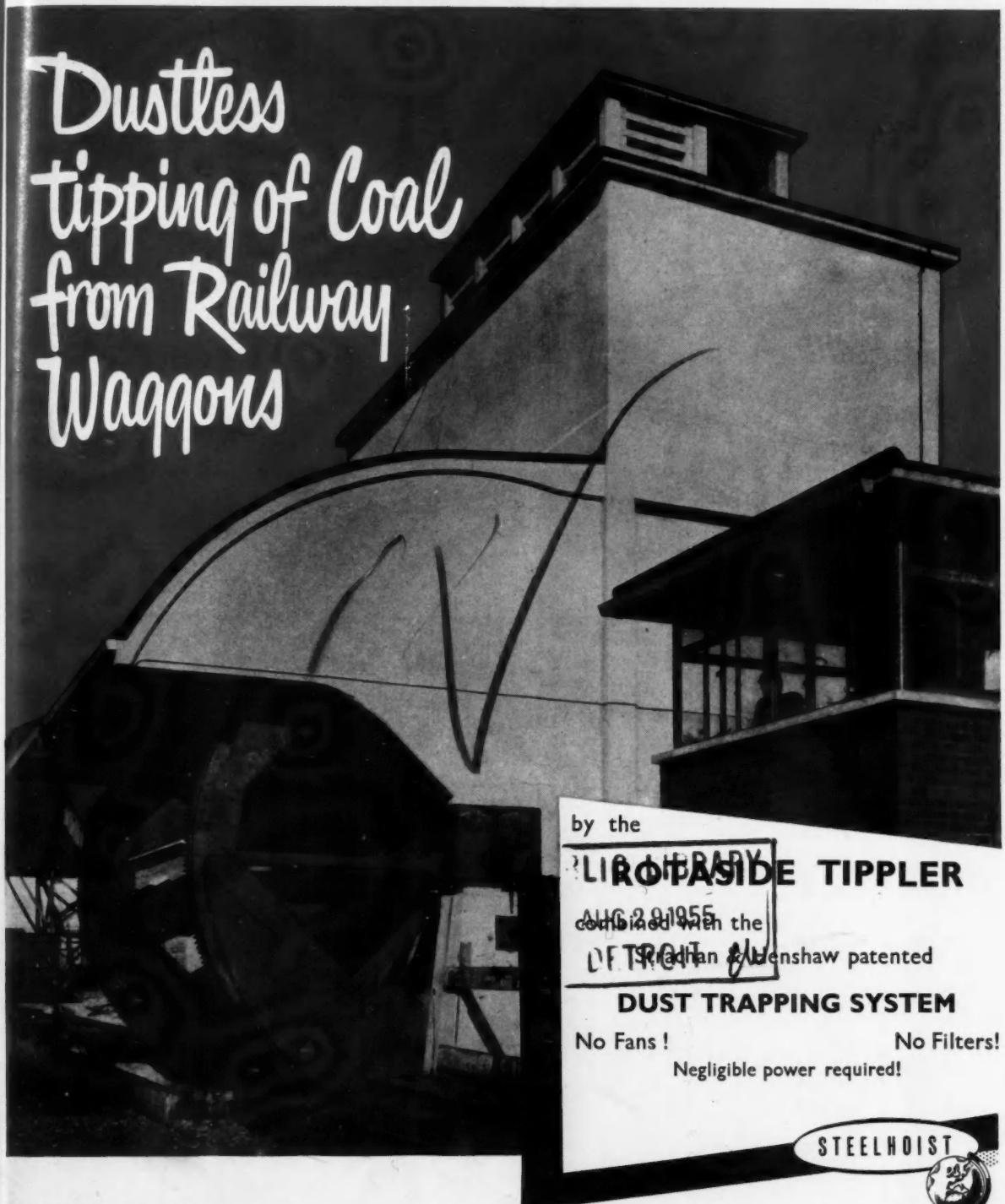
TECHNOLOGY DEPT.

Gas Journal

VOL. 283. 107th YEAR. LONDON, AUGUST 10, 1955. Nº 4810. PRICE 1/3



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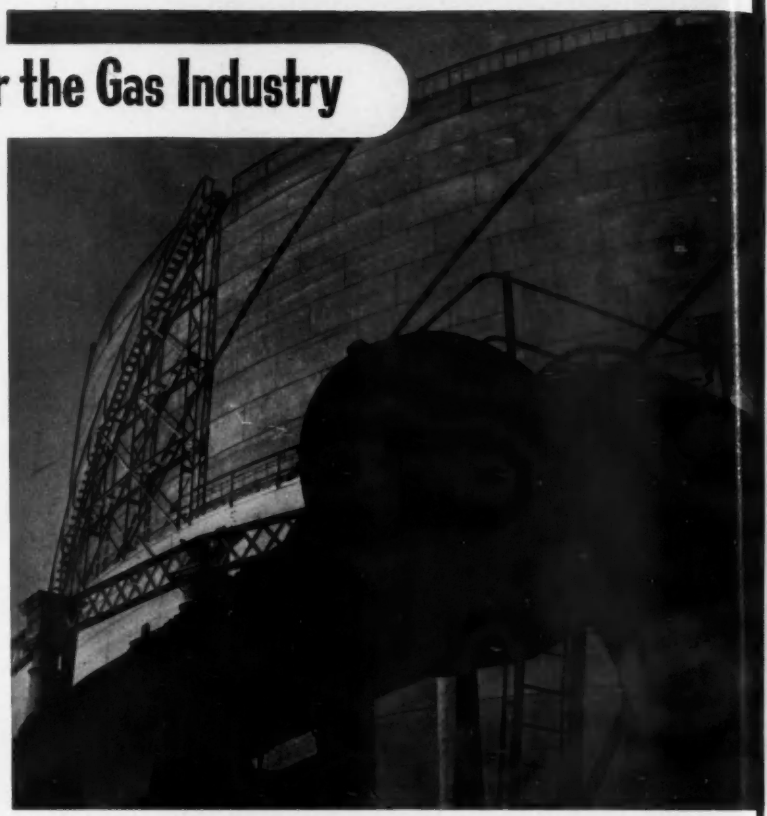

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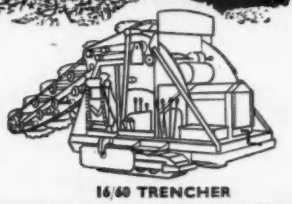

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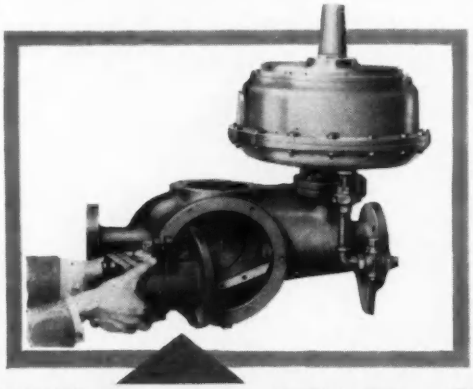

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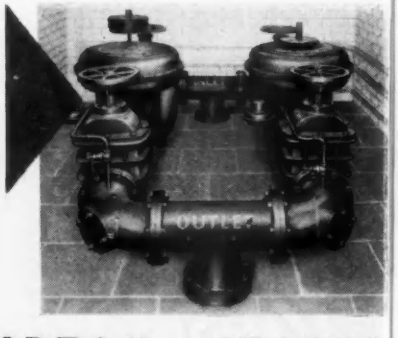

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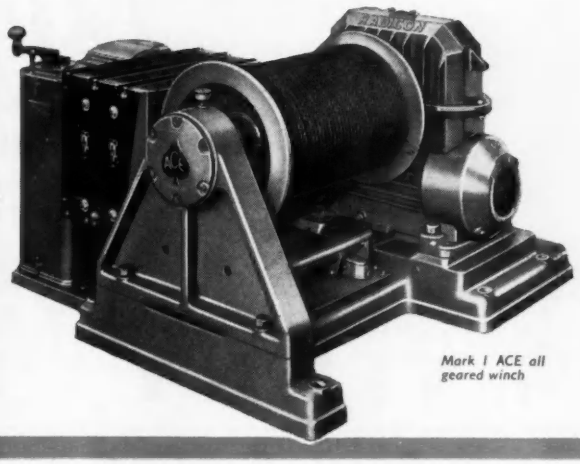

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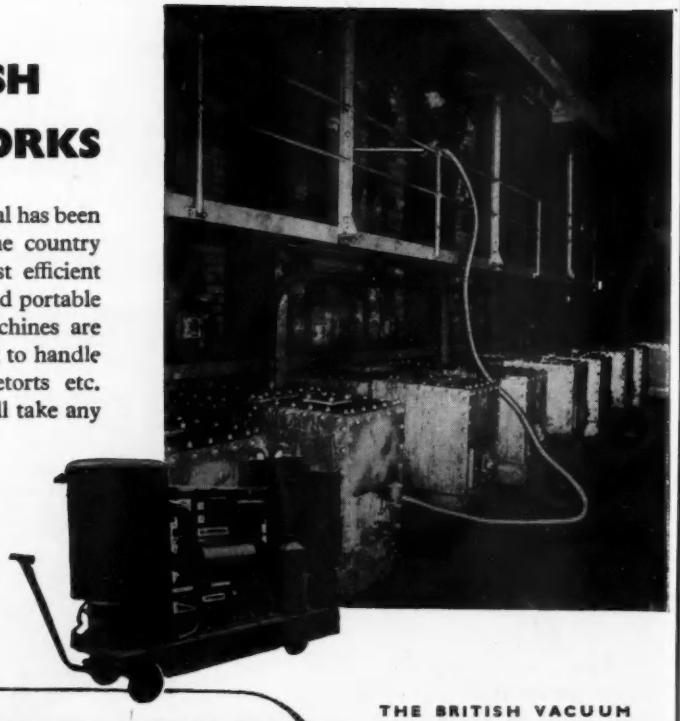

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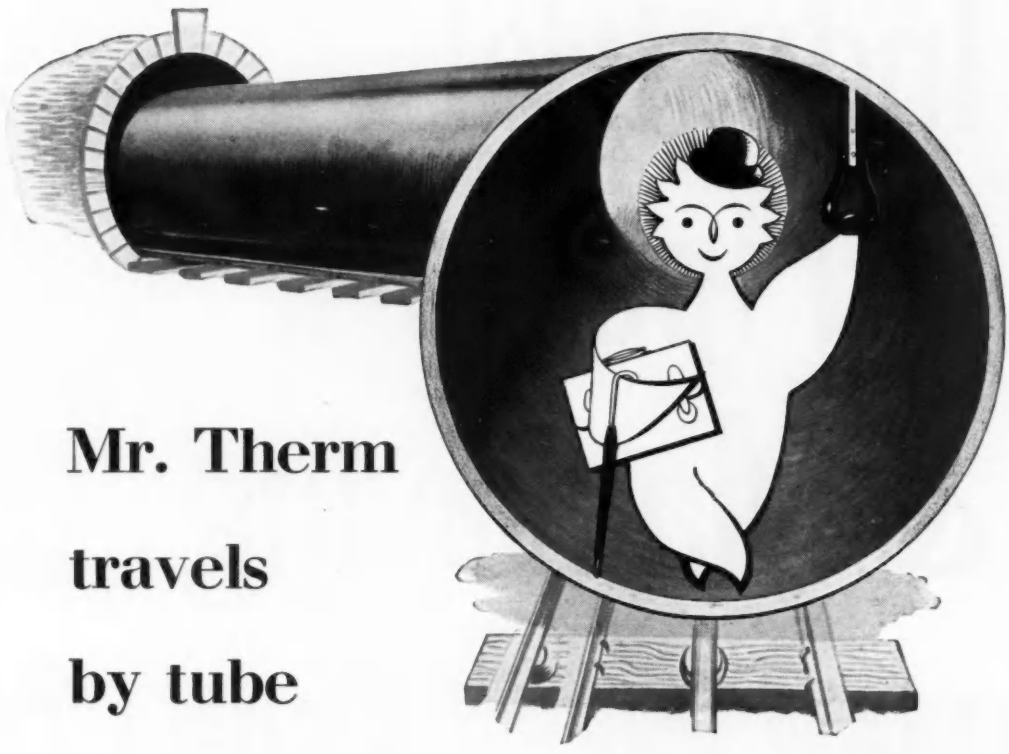

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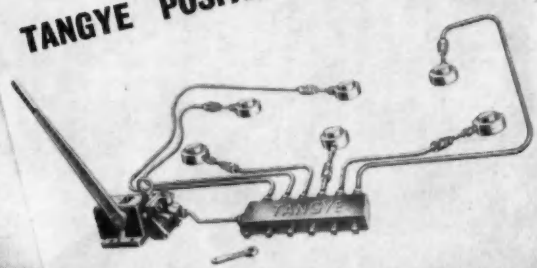

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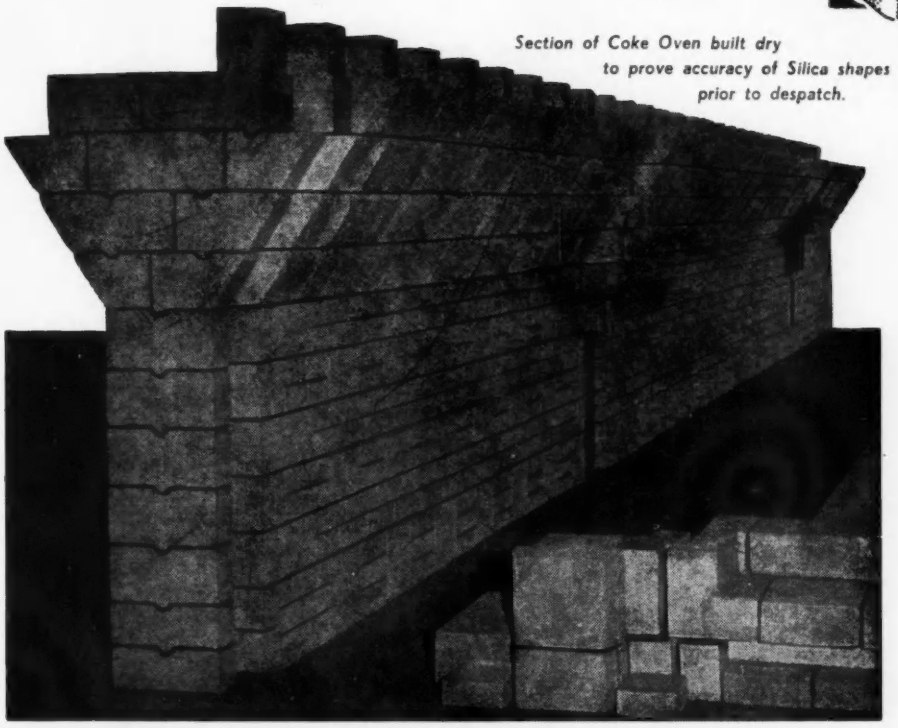

Section of Coke Oven built dry to prove accuracy of Silica shapes prior to despatch.

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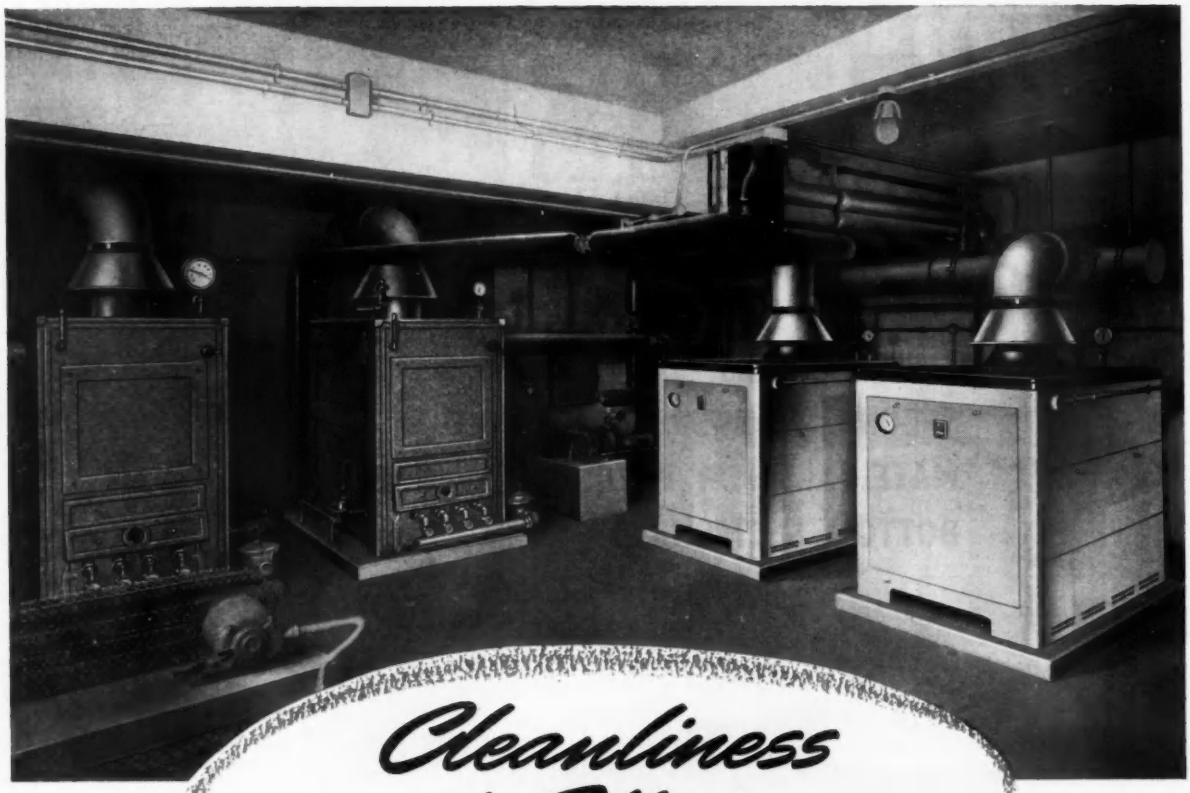

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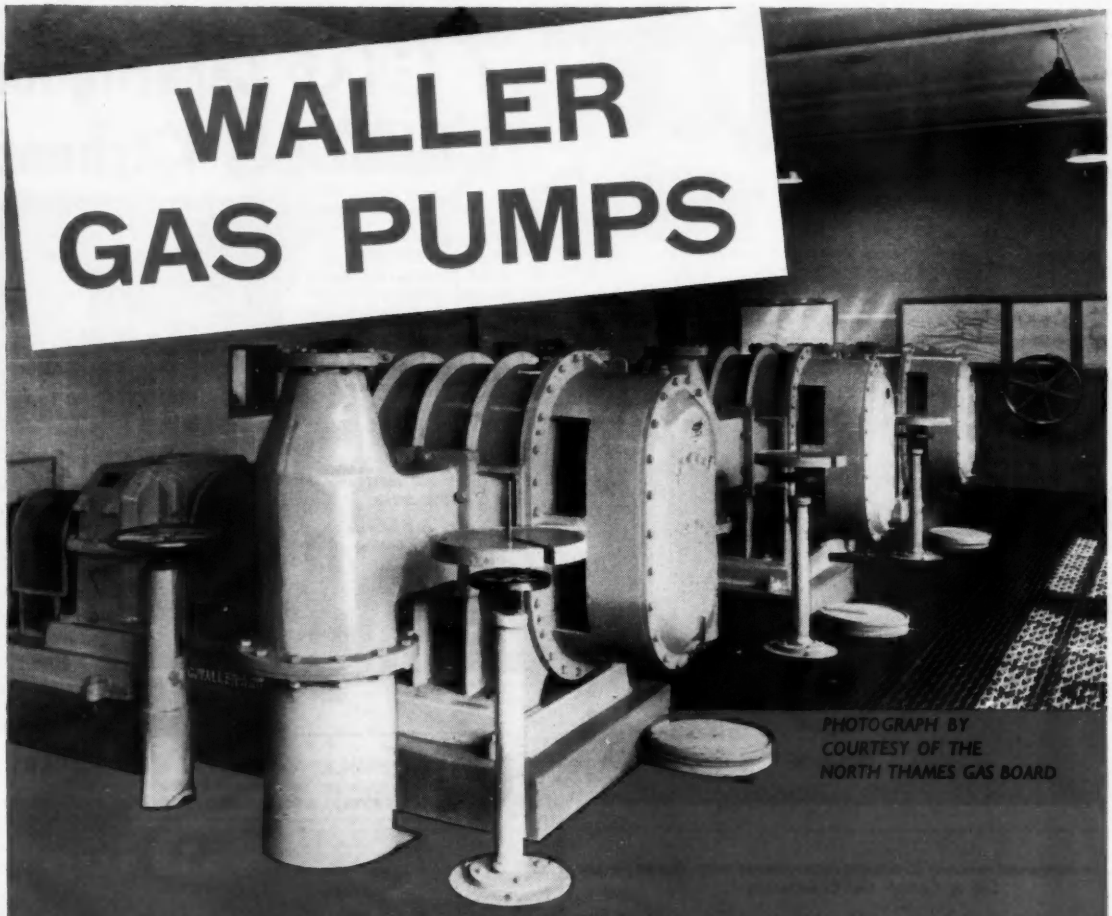

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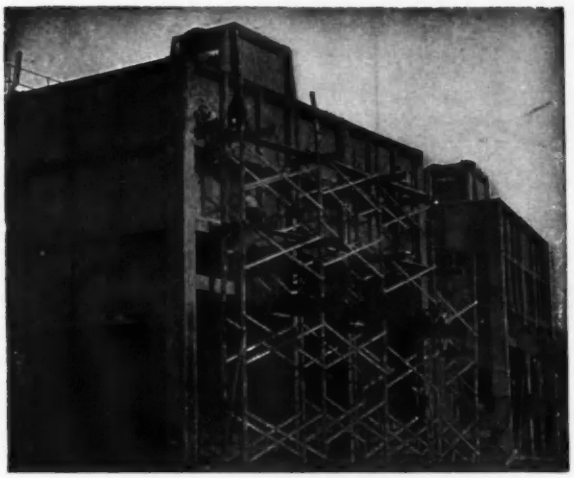

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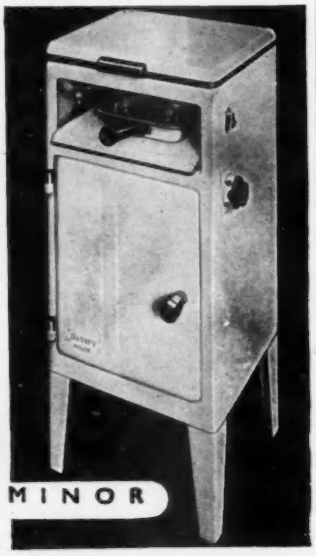

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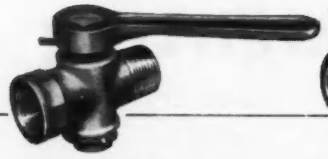
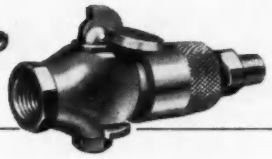


M & F Main Cock with Iron Key.



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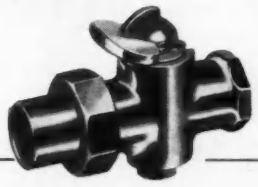
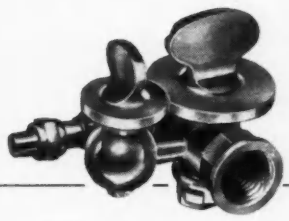


Union Cock with drop lever.

Gas Fire Cock with loose key, flanged for floor fixing.



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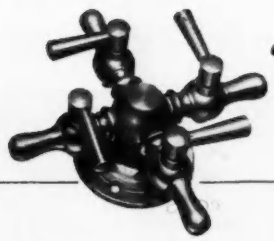
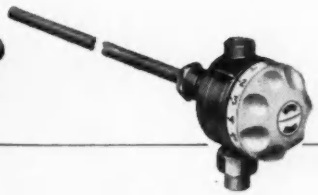


4 Way Laboratory Bench Cock, for Laboratory use.



Cooker Thermostat White plastic head with figures marked in black.

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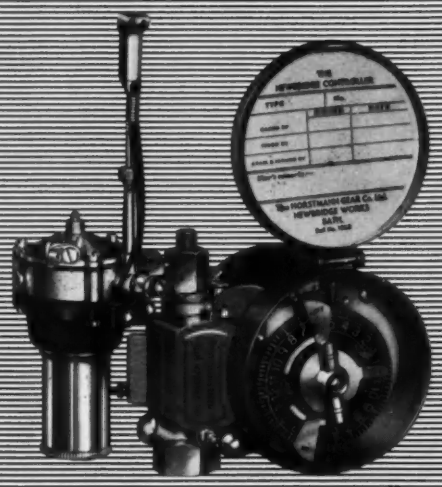

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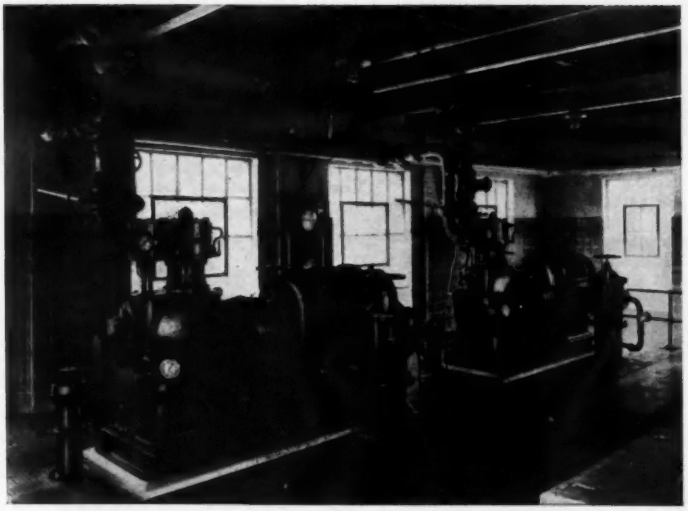

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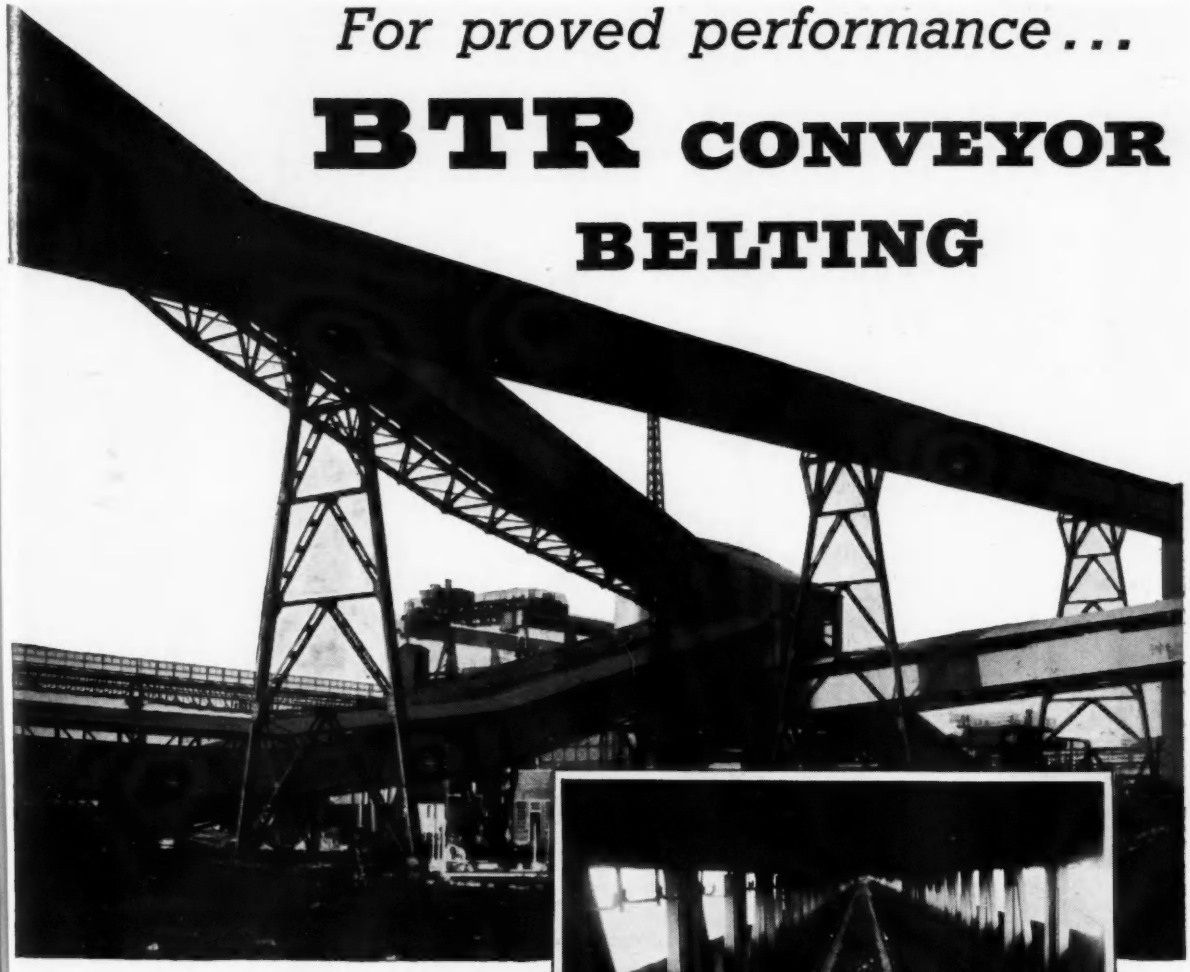

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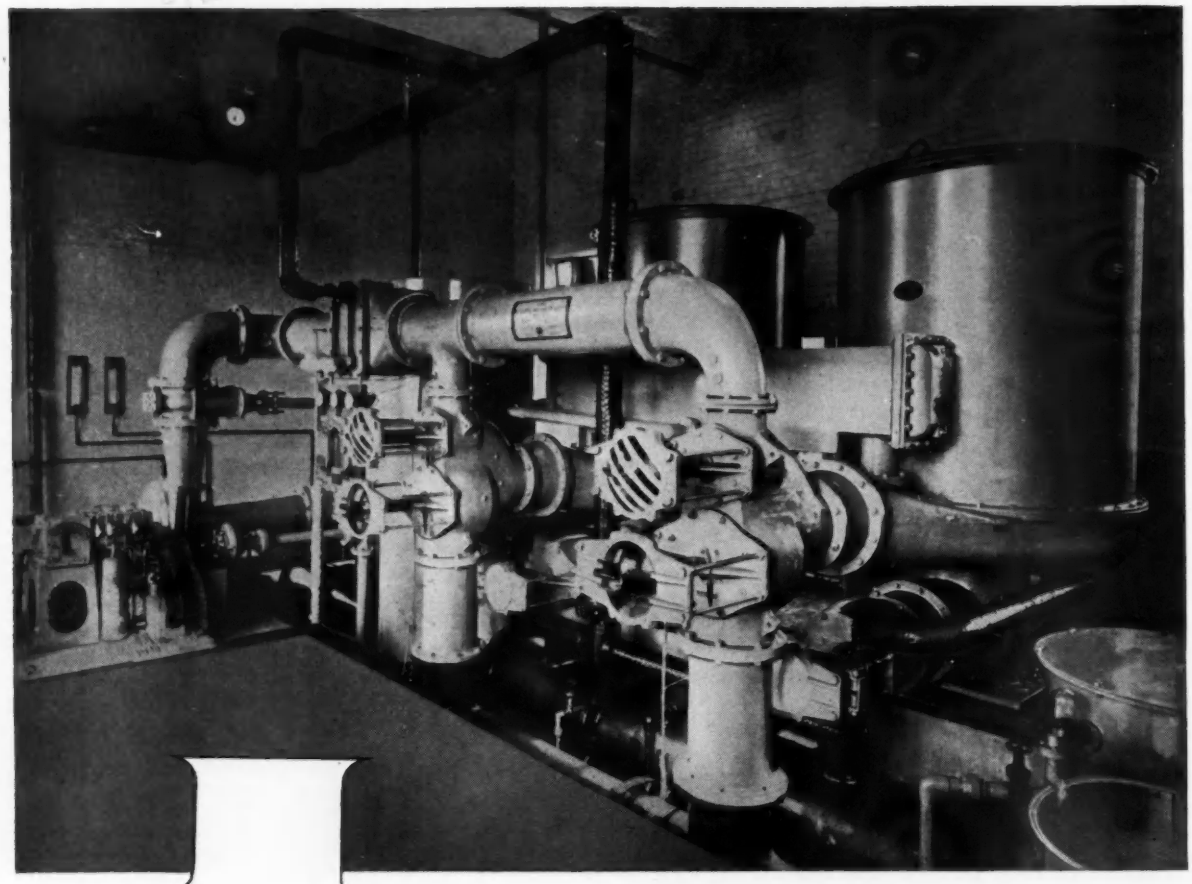

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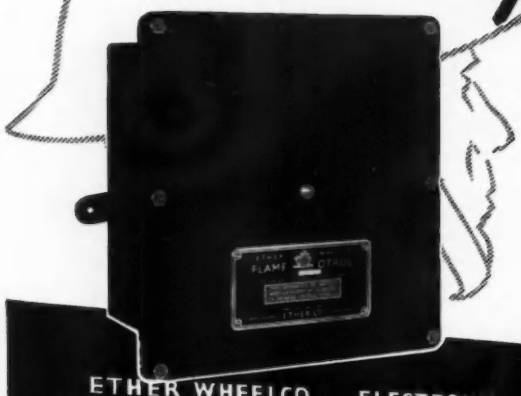

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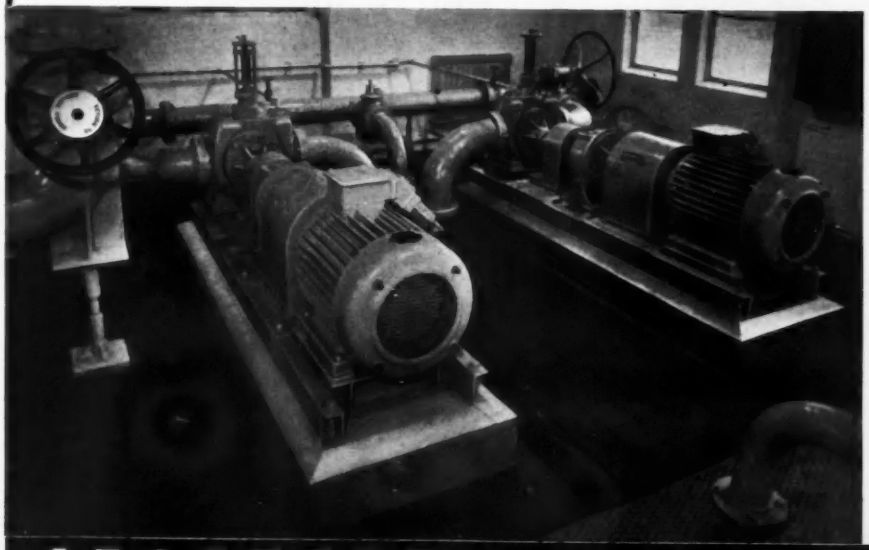

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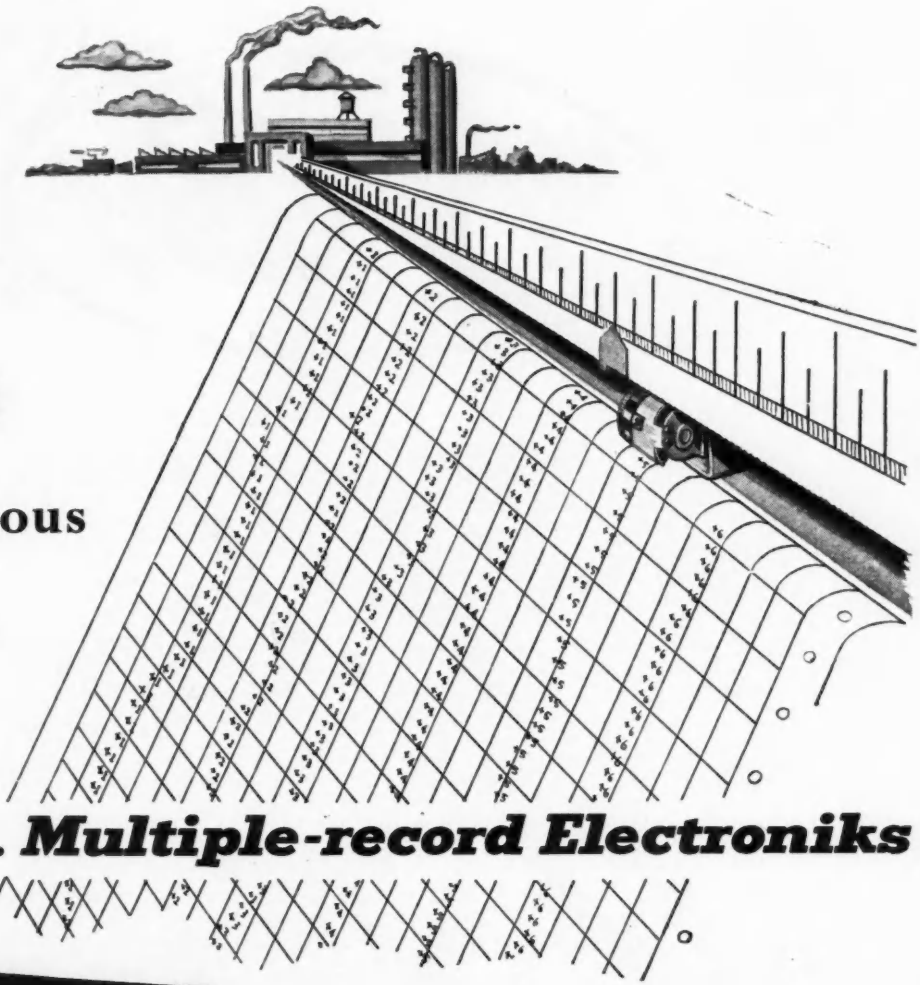

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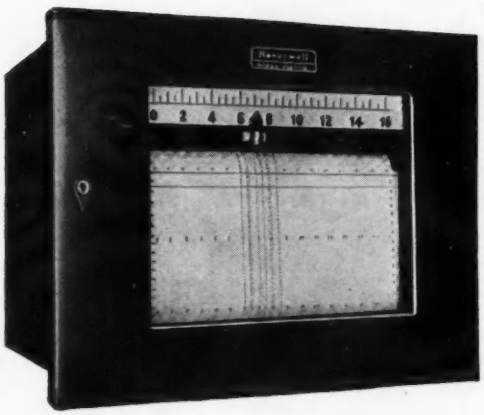

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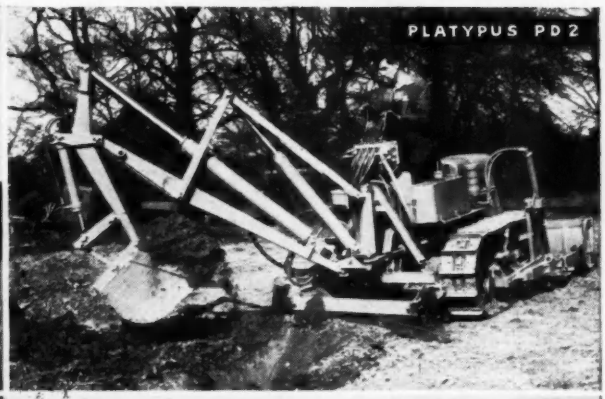

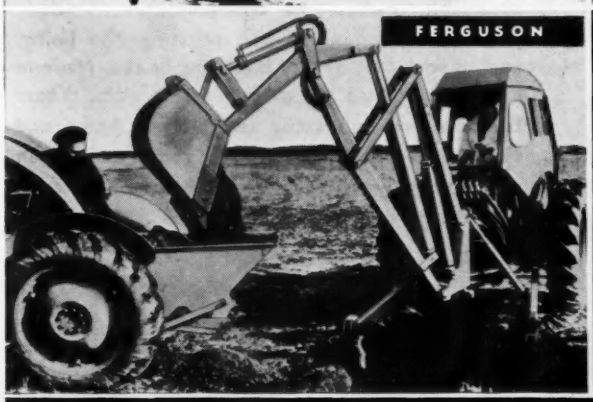

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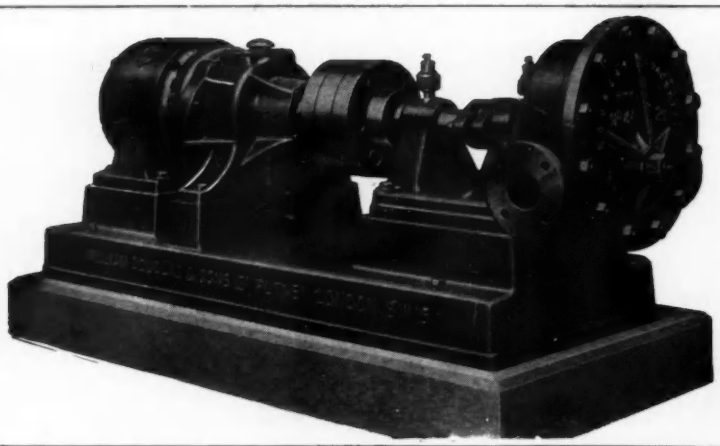

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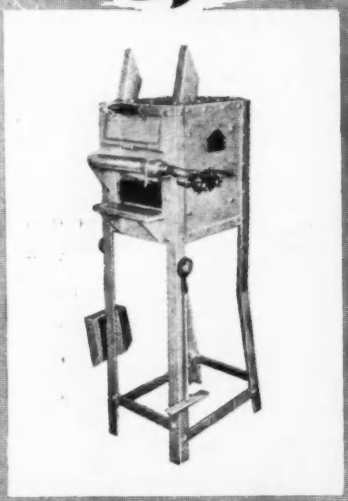

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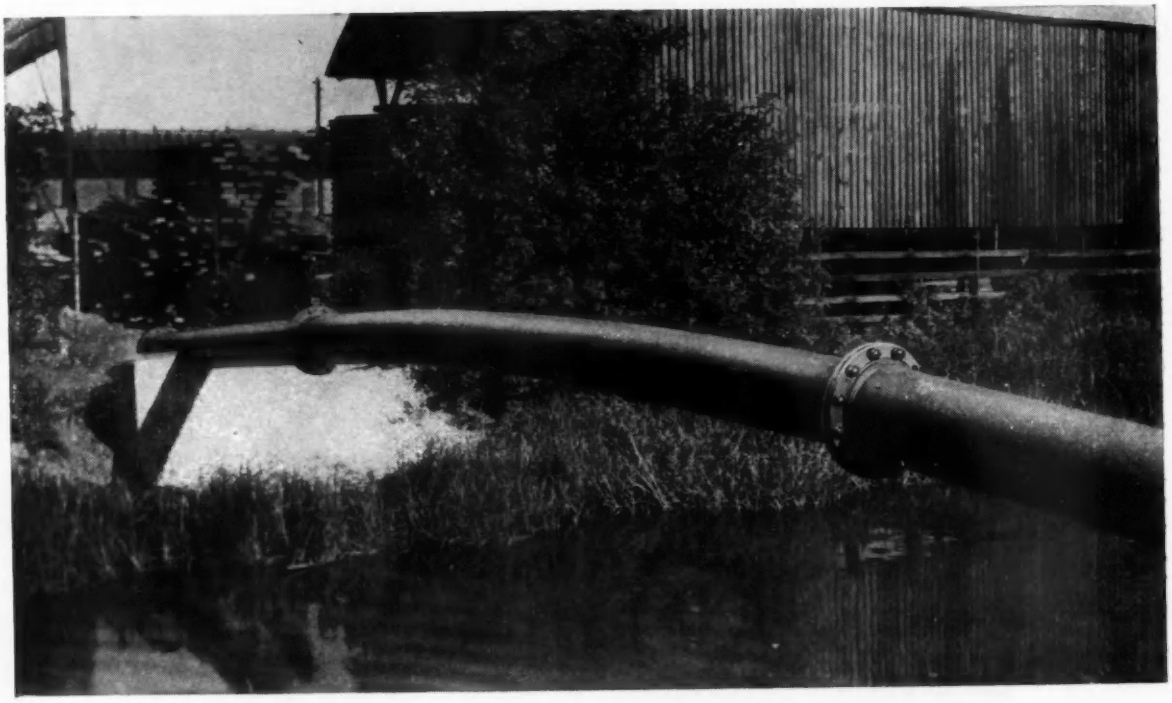

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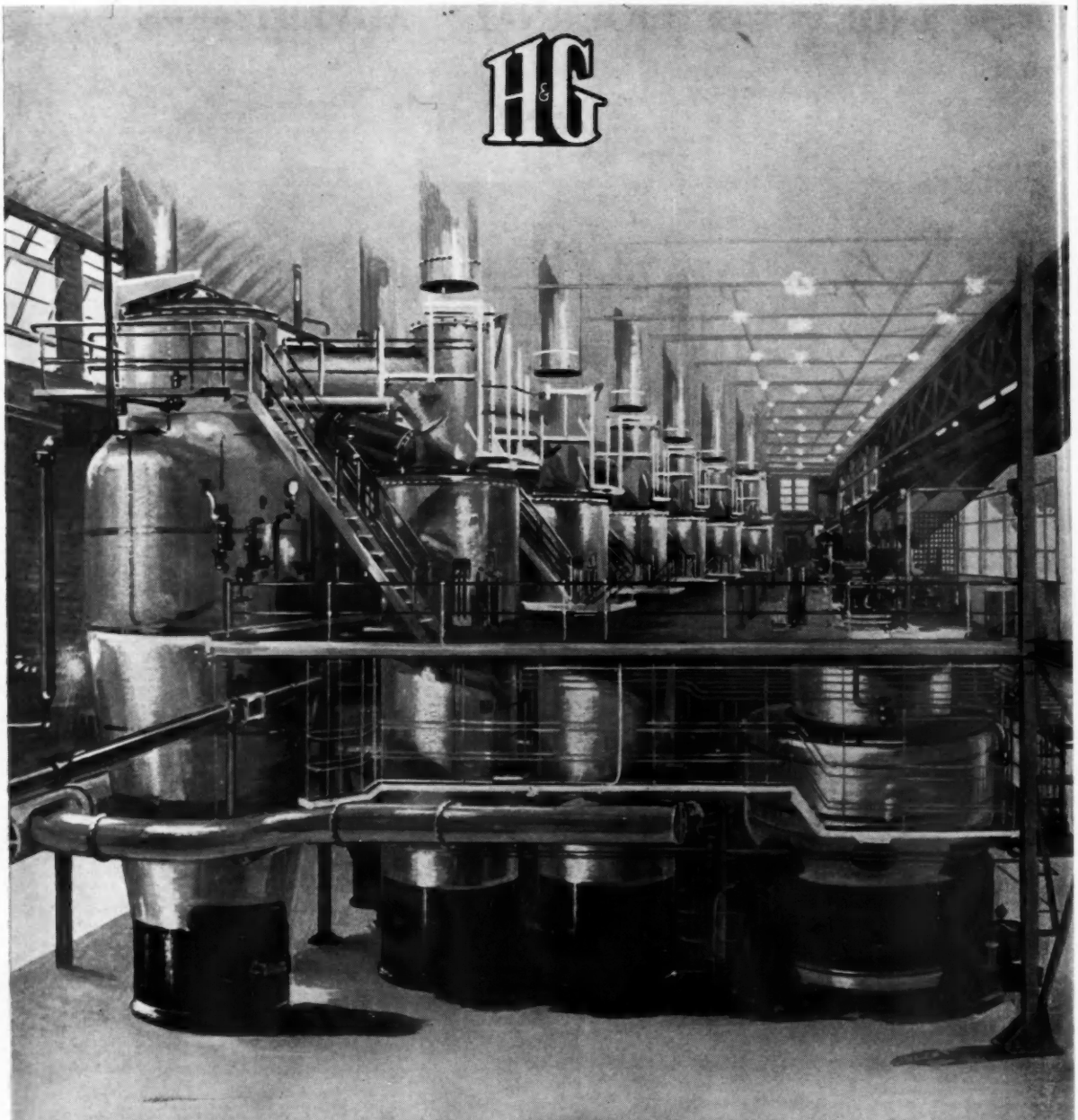
INDEX TO 'JOURNAL' ADVERTISERS

	PAGE
A	
A. .E. Machinery, Ltd.	347
A ott, Birks & Co., Ltd.	
A e Wringers, Ltd.	
A ogen Co., Ltd.	
A ograph Co., Ltd.	
A er & Mackay, Ltd.	
A ridge & Ranken Ltd.	
A an Taylor (Engineers), Ltd.	
A n, John & Son (Oxford) Ltd.	346
A al, Ltd.	404
A ot Gas Water Heaters, Ltd.	
A ot Gas Water Heaters, Ltd. (F. A. Neat)	
A more, Benson, Pease & Co.	Cover IV
A worth & Parker, Ltd.	
A inall's (Paints), Ltd.	
Associated Lead Manufacturers, Ltd.	
Associated Lead Manufacturers, Ltd. (Rustodian)	
Atlas Preservative Co., Ltd.	353
Audley Engineering Co., Ltd.	
Automatic Telephone & Electric Co., Ltd. ...	
Automotive Products, Ltd.	351
B	
Bale & Church, Ltd.	405
Balfour, Henry, & Co., Ltd.	
Bayley, Thos. (Great Bridge) Ltd.	404
Bagwaco Meters, Ltd. ... . facing p.	384
Banham & Sons, Ltd.	
Bartley Co., Ltd.	
Blakeley Firth, Sons & Co., Ltd.	
Bolton's Superheater & Pipe Works Ltd. ...	
Booth, John, & Sons (Bolton), Ltd.	
Bratt Colbran, Ltd.	
Bray, George, & Co., Ltd.	
Bray, W. E., & Co., Ltd.	
British Carbo-Norit Union Ltd.	403
British Flint & Cerium Manufacturers, Ltd. ...	
British Gas Purifying Materials Co.	406
British Jeffrey-Diamond, Ltd.	
British Oxygen Co., Ltd.	
British Paints, Ltd.	Cover II
British Rototherm Co., Ltd.	
British Thermostat Co., Ltd.	
British Thomson Houston, Ltd.	
British Tyre & Rubber Co., Ltd.	361
British Vacuum Cleaner & Engineering Co., Ltd.	348
Broadbent, Thomas, & Sons, Ltd.	
Broom & Wade, Ltd.	
Brown, J., & Co., Ltd.	
Bugden, Thos., & Co.	
C	
Cambridge Instrument Co., Ltd.	
Cannon (G. A.), Ltd.	
Cascade Water Coolers, Ltd.	
Cathodic Corrosion Control, Ltd.	
Cementation Co., Ltd.	354
Cinema-Television, Ltd.	
Clapham Bros., Ltd.	
Clayton, Son & Co., Ltd.	
Clifford Engineering Co., Ltd.	
Cochrane (Middlesbro') Foundry, Ltd.	
Cohen, George, Sons & Co., Ltd.	
Concrete Proofing Co., Ltd.	358
Consolidated Pneumatic Tool Co., Ltd.	
Consett Iron Co., Ltd.	355
Cort, Robt., & Son Ltd.	
Crane, Ltd.	404
Crone & Taylor, Ltd.	
Crosby & Co., Ltd.	
Crossley Bros.	
Crowley Russell, & Co., Ltd.	363
Curtis, A. L., & Co.	
Cutler, Samuel, & Sons, Ltd.	
Cuxson Gerrard & Co. Ltd.	
D	
Davenport Engineering Co., Ltd.	
Davey, Paxman & Co., Ltd.	408
Deb Chemical Proprietaries Ltd.	
De la Rue, Thomas, & Co., Ltd. (Gas Group) ...	
Dempster, R. & J., Ltd.	
Dempster, Robert, & Sons, Ltd.	382
Denison & Son, Ltd.	
Derbyshire Silica Firebrick Co., Ltd.	
Diaphragm & General Leather Co., Ltd. ...	
Dick, R. & J., Ltd.	
Donkin (The Bryan) Co., Ltd.	Cover II
Douglas, Wm., & Sons, Ltd.	368
Drakes, Ltd.	
Dresser Manufactures (England), Ltd.	
Drew, H. B., Ltd.	
Drummond Patents Ltd.	
E	
E.B. Refractory Cement Co., Ltd.	404
Edgar, William, & Son, Ltd.	
Elcontrol, Ltd.	
Electroflo Meters Co., Ltd.	
Electrolux, Ltd.	
Elliott Bros. (London), Ltd.	
Erskine, Heap & Co., Ltd.	
Essard Ltd.	
Essex Partners, Ltd.	
Ether, Ltd.	364
Evered & Co., Ltd.	
Ewart & Sons Ltd.	
Ewart Chainbelt Co., Ltd.	
F	
Fielden Electronics, Ltd.	
Fisher & Ludlow, Ltd.	
Fisher Governor Co., Ltd.	
F (continued)	PAGE
Flavel, S., & Co., Ltd.	
Fowler, John, & Co. (Leeds), Ltd.	
Franki Compressed Pile Co., Ltd.	
Franklin Furnace Co., Ltd.	
Fry's Metal Foundries, Ltd.	
G	
Gas Purification, Ltd.	405
General Descaling Co., Ltd.	
General Electric Co., Ltd.	
General Gas Appliances, Ltd.	
Gibbons Bros., Ltd.	
Glover, George, & Co., Ltd.	345
Glover, Thomas, & Co., Ltd.	374
Godfrey, Sir George, & Partners (Industrial), Ltd.	
Goodall Clayton & Co., Ltd.	368
Goodyear Mechanical Goods	
Grant, Lyon, & Co. Ltd.	
Graphite Products, Ltd.	
Green & Boulding, Ltd.	
Gunite Construction Co., Ltd.	
H	
Hamilton, A. H., & Co., Ltd.	
Hardman & Holden, Ltd.	
Harris & Pearson, Ltd.	
Harrisons (London), Ltd.	
Hattersley & Davidson	
Hawkins, W. T., & Co.	
Hayward, E. & Co. Ltd.	
Hick Hargreaves & Co., Ltd.	
Hilmor, Ltd.	
Hills (West Bromwich), Ltd.	
Holmes, W. C., & Co., Ltd.	407
Honeywell Brown, Ltd.	365
Hopkinsons, Ltd.	
Horseley Bridge & Thomas Piggott, Ltd. ...	
Horstmann Gear Co., Ltd.	360
Howden, James, & Co., Ltd.	
Humphreys & Glasgow, Ltd.	372
Hyde, Silas, Ltd.	
I	
Ideal Boilers & Radiators, Ltd.	356
I.C.I. Ltd. (Fyffes Fittings)	
I.C.I., Ltd. (Metals Division)	350
Inertol, Ltd.	
Infra Red Development Co., Ltd.	
Ingham, John, & Sons, Ltd.	
J	
Jeavons, E. E., & Co., Ltd.	370
Jeavons Engineering Co.	346
Jenkins, W. J., & Co., Ltd.	
Johnson, C. H. (Machinery), Ltd.	
K	
Keay, E. C. & J., Ltd.	
Keelavite Rotary Pumps & Motors Ltd. ...	
Keith Blackman, Ltd.	408
Kings Patent Agency, Ltd.	
King, Walter, Ltd.	
Kirk & Co. (Tubes), Ltd.	
Kirkham Hulett & Chandler, Ltd.	
L	
LaFarge Aluminous Cement Co., Ltd.	
Laidlaw, R., & Son (Edin.), Ltd.	
Lamont, James H., & Co., Ltd.	
Le Bas Tube Co., Ltd.	
Leeds Fireclay, Co., Ltd.	
Lindsay, Henry, Ltd.	403
Lionweld, Ltd.	
Lind, Peter, Ltd.	
M	
Macpherson, Donald, & Co. Ltd.	
Magnetic Valve Co., Ltd	
Main, R. & A., Ltd.	400, 401
Mapel Metal & Pipeline Endurance, Ltd. ...	352
Matterson, Ltd.	
Meltham Silica Fire Brick Co., Ltd.	
Mercol Products, Ltd.	
Meters, Ltd.	
Metropolitan Leather Co., Ltd.	
Metropolitan Vickers Electrical Co., Ltd. ...	
Midland Iron & Hardware Co. (Cradley Heath), Ltd.	
Milnes Meters. Ltd.	
Mint, Birmingham, Ltd.	
Mitchell Engineering, Ltd.	
Mitchell, H., & Co.	
Monitor Engineering & Oil Appliances, Ltd. ...	
Monk, A., & Co., Ltd.	
Morley Products (Padiham) Ltd.	
Murchie Trading Co., Ltd.	
N	
National Benzole Co., Ltd.	
National Cash Register Co., Ltd.	
National Enamels, Ltd.	
Newton Chambers & Co., Ltd.	
Norwest Construction Co., Ltd.	
Nu-Swift, Ltd.	405
O	
Oxley Engineering Co., Ltd.	
P	
Parkinson & Cowan (Gas Meters), Ltd.	374
Parkinson Stove Co., Ltd.	395
Pass, E., & Co., Ltd.	403
Peart, E., & Co., Ltd.	
Peebles & Co., Ltd.	
Perl Controls, Ltd.	373
Plenty, & Son Ltd.	404
P (continued)	PAGE
Power-Gas Corporation, Ltd.	Cover IV
Press, William, & Son, Ltd.	349
Pulsometer Engineering Co., Ltd.	
Pyrene Co., Ltd.	
R	
Radiant Heating, Ltd	
Radiation, Ltd.	396, 397
Rawlplug Co., Ltd.	352
Reavell & Co., Ltd.	404
Ride & Bell, Ltd.	
Riley, A. J., & Son, Ltd.	
Roberts, R. E., & Sons, Ltd.	366
Robinson, J. H., & Co. (Liverpool), Ltd. ...	
Rotameter Manufacturing Co. Ltd.	
Royston, Geo., & Sons, Ltd.	
Rozalex Ltd.	
Russell, R., & Sons Ltd.	358
S	
Salter, T. E., Ltd.	
Sankey-Sheldon Ltd.	
Senior Economisers, Ltd.	
Shaw & McInnes Ltd.	
Siebe Gorman & Co., Ltd.	
Sieber, Jas., Equipment Co., Ltd.	
Siemens-Schuckert (Great Britain), Ltd. ...	
Sigma Instrument Co., Ltd.	
Simon-Carves, Ltd.	
Simon, Richard, & Sons, Ltd.	
Sisson, W., & Co., Ltd.	360
Smith Meters, Ltd. ... . facing p.	388
Smith, Thos., & Sons (Rodley), Ltd. ...	
Spencer Bonecourt, Ltd.	
Sperryn & Co., Ltd.	345
Stanton Ironworks Co., Ltd.	
Staveley Iron & Chemical Co., Ltd. .. facing p.	389
Stein, John G., & Co., Ltd.	
Stelcon (Industrial Floors) Ltd.	
Stewart & Gray, Ltd.	
Stewarts & Lloyds, Ltd.	
Stothert & Pitt, Ltd.	364
Stoves, Ltd.	
Strachan & Henshaw, Ltd.	Cover I
Stringer Bros.	406
Sugg, Wm., & Co., Ltd.	359
Supra Chemicals & Paints, Ltd.	
Sutcliffe, R., Ltd.	
Sutcliffe Speakman & Co., Ltd.	362
Sutherland, A. G., Ltd.	
T	
T & T Works, Ltd.	
Tangyes, Ltd.	354
Taylor Bros.	
Thermal Syndicate, Ltd.	
Thompson, Edward, Ltd.	358
Thorp, Thomas, & Co., Ltd.	
Tully Engineering Co., Ltd.	
Turners Asbestos Cement Co., Ltd. .. facing p.	385
U	
Underpressure Engineering Co., Ltd. ...	
United Kingdom Construction & Engin. Co., Ltd.	
Unit Superheater & Pipe Co., Ltd.	
V	
Vaughan, Edgar & Co., Ltd.	
Visco Engineering Co., Ltd.	
Vulcan Stove Co., Ltd.	
W	
Waddington G., & Son, Ltd.	
Wade Couplings, Ltd.	
Wakelin, F. H., Ltd.	406
Walker, C. & W., Ltd.	
Walker, Crosweller & Co., Ltd.	
Walker, Wm., & Sons (Hanley), Ltd.	348
Waller, George, & Sons, Ltd.	357
Walter King, Ltd.	
Ward, Thos. W., Ltd.	369
Watson, Robt., & Co. (Constructional Engineers) Ltd.	
Weir, G. & J., Ltd.	
Wellington Tube Works, Ltd.	
Wellman Smith Owen Engineering Corpn., Ltd.	
West's Gas Improvement Co., Ltd. ...	Cover III
West's Gas Improvement Co., Ltd. (C.O.L. Division)	
West's Piling & Construction Co.	
Westwood & Wrights, Ltd.	
Whessoe, Ltd.	
Whitley Moran & Co., Ltd.	
Whitlock Bros., Ltd.	367
Wilkes, A. H., & Co., Ltd.	368
Willey & Co., Ltd.	
Williams, John E., Ltd.	
Williamson Cliff, Ltd.	
Wilson, George, Gas Meters, Ltd.	
Winn & Coales, Ltd.	
Woodall-Duckham Construction Co., Ltd. ...	381
Wood, Hugh, & Co., Ltd.	
Wormald Patent Locks Co., Ltd.	
Y	
Yorkshire Copper Works, Ltd.	
Agencies	
Appointments Vacant	405, 406
Appointment Wanted	
Contracts Open	
Educational	
Fellowship	
Miscellaneous	
Patents	
Plant For Sale	406
Publications	406



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Gas Journal

VOL. 283 *NO. 4810* *August 10, 1955*

107TH YEAR

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EDITOR: Trevor G. Williams, A.M.I.Mech.E., Assoc.Inst.Gas E., M.Inst.F.

DEPUTY EDITOR: Arthur C. Cross

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CONTENTS

EDITORIAL COMMENT

Golden Jubilee of Public Service .. 375
Coke Price Discrimination .. 376
Water Heating by Gas .. 376
Unsolicited Testimonials .. 377
School for Coke Salesmen .. 377

SPECIAL ARTICLES

New Ideas in Manometer Design. By Leslie T. Minchin .. 389
Portable Cover Furnace Installation: Development Committee's Report .. 390

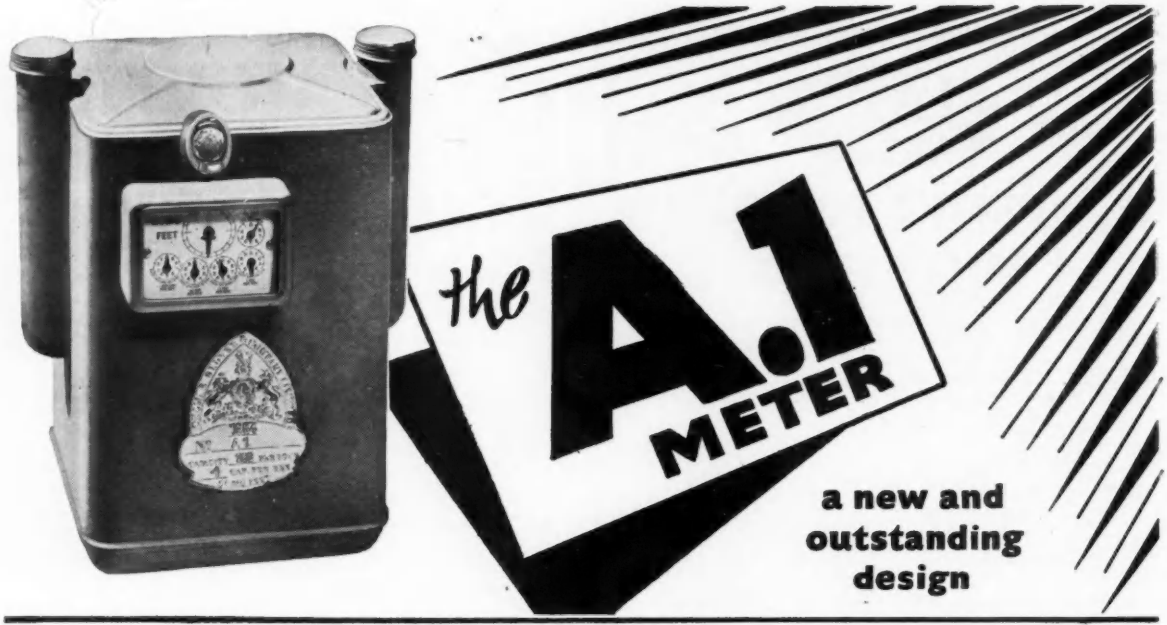
TECHNICAL RECORD

Gas in the Glass Industry. By H. R. Hems .. 379
Instrumentation and the Gas Industry—Part 6. By A. Linford and G. C. Farmer .. 383
Oxide Purification in the Midlands. By F. Grocott .. 385

NEWS OF CURRENT EVENTS

Personal .. 378
Obituary .. 378
Diary .. 378
British Chemical Plant .. 380
Bunsen Burner Centenary .. 388
National Industrial Safety Week .. 388
Consumers' Councils Review Coal and Coke Problems .. 391
Fracture of Gas Pipes .. 392
A Prize Winning Window .. 393
Radiation Cookery Book .. 393
Gas to be Piped across the Border .. 393
£25 for Best Suggestion .. 393
East Midlands Adopts 'Cushion' Gas Tariff .. 394
Dutch Schoolgirls in Liverpool .. 394
NALGO Attains its Golden Jubilee .. 398
'Live Water' Display at Selfridges .. 398
Trade News .. 399

PUBLISHERS' NOTICE, SEE PAGE 341, AUG. 3, 1955



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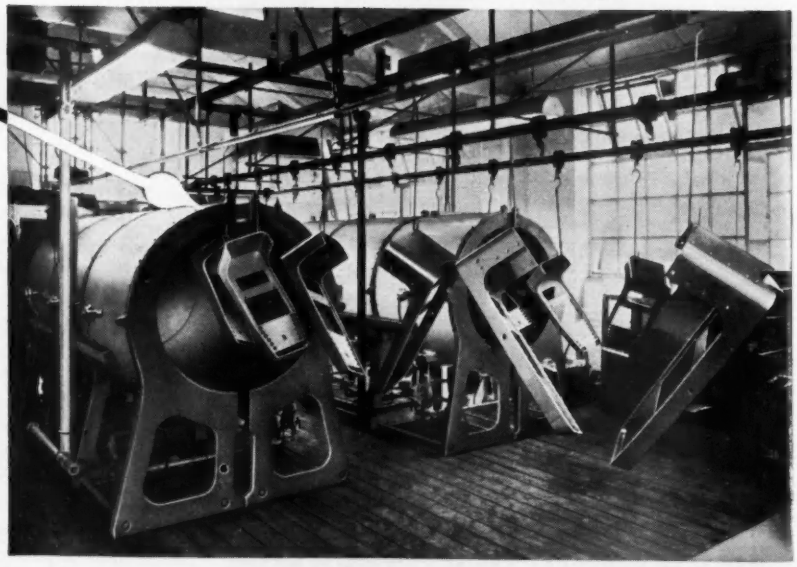

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Gas Journal

VOLUME 283. No. 4810. AUGUST 10, 1955. 107th YEAR

Golden Jubilee of Public Service

WE publish on another page in this issue a series of goodwill messages received by the National and Local Government Officers Association from the Minister of Fuel and Power, the Chairman of the Gas Council, and the two organizations which share with NALGO in the representation of officers and staff in the gas industry's national, area, and local negotiating machinery. The Association has just celebrated its Golden Jubilee, having been formed on July 29, 1905, as a federation of nine local guilds of council officials which had been formed during the preceding 10 years. The 'JOURNAL' was a youngster of 56 when NALGO was born, and we have watched its progress with interest and goodwill, particularly in an industry whose relations between employer and employed have been so consistently good. The interests of black-coated workers in the gas industry are now looked after by three organizations. It is not for us to discuss why there should be three bodies with broadly similar aims, or to compare one with another, but NALGO is the oldest. It has adapted itself to the changes wrought by bringing company and municipal gas undertakings under nationalised ownership and it numbers among its members many who have rendered outstanding service to a great industry. We salute NALGO and wish it well as it enters on the second half of its century.

In its first 50 years NALGO increased its membership from 8,000 to 250,000, its annual income from £50 to £500,000, and its range from a single public service—local government—to seven more, for today its members include the non-manual employees of the gas and electricity boards, the national health service, new towns, docks and canals, and water and road passenger transport companies. When the Association was founded, council officials were isolated, ill-educated, and badly paid. Few had any training or qualifications for their work, and salaries for the majority ranged between 5s. and £2 a week, and varied widely not only from one authority to another, but even between departments of a single authority. By 1910 it was conducting its own entrance and promotion examinations. In 1920 it started a correspondence school, and in 1930 held the first of many summer and week-end schools. It persuaded universities to teach public administration, awarded scholarships, made loans to students, and opened a lending library for them.

The same responsible spirit inspired its trade union work. Preferring the force of argument to the argument of force, it was one of the first to support 'Whitleyism' or collective bargaining, pioneering the formation of a National Whitley Council for local government as early as 1920. Local authorities opposed its efforts, and the Council collapsed within a year. For the next 22 years NALGO worked patiently to rebuild it, succeeding at last in 1943. Three years later the new National Whitley Council adopted a national code, proposed by NALGO, of recruitment, training, salaries, service conditions, and professional ethics for all local government officers, and approved a comprehensive scheme of entrance and promotion examinations.

Since the war, the Association's biggest problem has been to maintain, in the face of inflation and the post-war social revolution, the hard-won standards of its members and the efficiency of the public services it played so big a part in creating. Today, 'white collar' employment has lost most of the attraction it formerly had, salaries have failed to keep pace with rising prices and, in consequence, the public services NALGO represents are failing to attract recruits of the quality they need to retain the ablest men and women they have recruited and trained in the past. But those services, providing, as they do, most of the necessities of civilized life—water, gas, electricity, transport, sanitation, hospitals, protection, welfare, and many more—are vital to national existence and prosperity. Recognizing this, and conscious of what it has done to create them and make them more efficient and acceptable, NALGO has embarked this year on a fresh campaign to make each one, in the words it used in 1926, a service 'into which the best brains and ablest intellects in the country may be attracted and the finest ability utilized and retained'. It celebrates its Jubilee with pride in past achievements and the strength and power it has attained; it approaches the more difficult tasks of the future with the responsibility with which its founders endowed it undimmed.

Before nationalisation the non-manual employees of gas companies—representing about two-thirds of the industry—were not interested in what was then the National Association of Local Government Officers, but towards the end of the war, with nationalisation looming ahead, they began to share with their municipal brethren a sense of the desirability, if not the actual need, for adequate organization, and the British Gas Staff Association (based on local associations which had already

been working for some time) and the Gas Officers Guild came into being two or three years before the Gas Act was passed. NALGO meanwhile saw the need for broadening its basis to cover all the non-manual workers in all the nationalised industries, and while it retained its familiar short title it changed its full name to the National and Local Government Officers Association. With its very large membership it has provided probably the widest range of services of any trade union, including free legal advice and protection, a benevolent fund, its own insurance company, building society, three holiday centres, a travel bureau, two convalescent homes, and a monthly magazine. We would only add that the magnanimity of the messages from the other organizations testifies to the very cordial relations that exist not only between employer and employed in the gas industry but also among bodies which are in many respects vigorous rivals.

Coke Price Discrimination

THERE can be little doubt that the announcement on August 2, of swingeing increases in the price of coke throughout the country, came as a profound shock to consumers, domestic and industrial alike. Although Sir Harold Smith, by his statement on July 8, prepared the ground for some startling news about coke prices, nevertheless, few thought that the increase, when it came, would be of such magnitude. The rise in price differs throughout the country and varies from approximately 18s. per ton in the North and Midlands to about 30s. per ton in the South. For instance, the new prices for bagged coke in Newcastle and Leeds are 129s. 10d. and 133s. 11d. per ton compared with 109s. 10d. and 115s. 2d., while in London the new price is 163s. 2d. per ton compared with 133s. 2d.

Probably it is more than a coincidence that these increases were announced just a week after the publication of the Government's Clean Air Bill, with all that it implies for coke. It would seem fairly evident that the Gas Council and the area boards recognize that, in the near future, the demand for coke is likely to increase at such a rate as to get completely out of hand unless something is done about it. Apparently the gas industry cannot see its way to meeting a greatly increased demand, and consequently has adopted the alternative method of attempting to reduce it. In our first leading article last week, we referred to the proposal that coke should be sold at its economic price; and it is very probable that the Gas Council believes that the new charges for coke are the present economic prices, taking into account the recent increases in the cost of coal. This would seem to be indicated by the statement of a Gas Council spokesman that ' they have decided to let coke prices find their own level '.

It is not surprising that public and press reaction to what one newspaper called the ' whopping rise in the cost of coke ', should be violent and extremely vocal. Comments which have reached us indicate that many consumers are frankly puzzled about the arguments used by the Gas Council to explain the need for such a large increase, and are even more puzzled about the evident discrimination between North and South. Assuming that the substantial rise in coke charges had to come, the staggering differential between prices in the North and South of the country is a particular thorn in the flesh of the Southerner. He cannot see why he should have had to pay more, originally, for his coke than the Northerner and why—adding insult to injury—the present increase itself should be greater.

And here a matter of fundamental importance is involved. Why should the products of a nationalised industry vary in price so widely in different parts, especially in these days when wages and salaries throughout the country are more nearly uniform than they have ever been? Naturally the gas industry claims in explanation of its price disparities that, so long as coal costs more in the South than in the North, so long will the products of coal carbonization cost more. But is it absolutely necessary that coal should cost more in the South than in the North? After all, the coal, gas, and electricity industries all belong to the nation and have done so for some time. They provide an essential fuel service in the same way as the Post Office provides communications—yet our postal rates do not vary from one place to another! Surely it is not impossible for a more equable balance to be struck? It would seem desirable in the interests of fair shares; and if ever a truly national fuel policy emerges, some such conception will have to be taken into account. Meanwhile, the unfortunate Southerner has to pay 30s. more for his ton of coke while his friends and relatives in a slightly higher latitude get away with an 18s. increase. There may be advantages in living in the South, but in these days of soaring prices they can hardly be described as financial.

Water Heating by Gas

NO better subject could have been chosen to represent to the Institution the work of the Junior Gas Associations than the problem of domestic water heating. It is essentially a problem to be solved by intensive and individual detail work. And all will agree with Mr. W. R. H. Lorimer, by whom the paper was prepared and presented, that the water heating load is of prime importance. No doubt Mr. Lorimer was well advised to take the positive line, to show what gas can do and how it can be done. He dismisses our competitors very calmly. ' Electricity and solid fuels both provide serious competition, and the success of the former in recent years has been considerable.' Is it not more serious than that? It is not that Mr. Lorimer is unaware of the difficulties under which gas labours in the struggle with electricity, particularly for this important market. He recognizes the practical difficulties associated with the provision of flues and even the accommodation for the heater itself which ' tell against the gas installation.' And if he himself says little about the handicap of organic sulphur, his repeated insistence on adequate ventilation implies that he knows all about it. All the contributors to the discussion evidently know all about it too. Mr. Wadsworth pleaded for ' some reduction ' in the sulphur content of town gas if the problems arising out of the use of copper in the heat-exchange unit were to be largely overcome. Mr. Haddon stipulates among points for consideration the virtual elimination of organic sulphur. And Mr. Purkiss, of Watson House, insists that the maintenance of water heaters is bound up to a considerable extent with the sulphur problem.

One wonders whether there is a sufficient air of urgency in these calm utterances. It is not only that the cost of maintenance is increased by the presence of a large organic sulphur content in the gas supplied, but that the housewife hates most intensely the filthy job of cleaning away deposits of sulphur salts from water heating units. Gas will always be to some extent handicapped in the home by the necessity of leading away or dissipating the products of combustion. It is many years now since appliance manufacturers began to warn the gas engineer that this handicap is increased to a dangerous degree by organic sulphur. There is no need to re-tell the story here.

Mr. Lorimer analyzes the situation very fully. It falls into two main categories, the old house and the new. His short note on the opportunities now offered by the two Acts which he cites is well set out. Installations in the old houses will be secured only by intensive salesmanship through a competent practical man who has access to the premises and has the confidence of the householder. One of the big difficulties he will have to overcome is the provision of adequate ventilation often involving more or less small structural alterations which the owner-occupier is often reluctant to undertake. The problem of the new houses, and particularly those built by the local authority, is one for negotiation at the highest levels. It is disappointing that, in so many instances, local authority and Government departments have not appreciated the immense advantage in coal economy that might have been achieved if gas and coke had been intelligently adopted for space and water heating in the new housing estates.

The detail of the subject is well worked out. Preference in the North for the storage type of water heater is noteworthy. There is no doubt that a combination of the back boiler and a gas heater can be very economical and convenient, the storage taking the place of the usual hot-water cylinder. An interesting development is the open coke fire with back boiler and a gas heater which can be brought to bear on the same boiler in the summer when the open fire is not in use. It is indeed to water heating that the industry can look for an increase in domestic consumption, the decline in which formed the subject of another paper. It is a load which is of particular importance because it tends to a maximum in the summer. It can help to level out the load and it can combine well with coke.

UNSOLICITED TESTIMONIALS

BOUQUETS seldom come the way of the nationalised industries or the public utilities. It is the more refreshing, therefore, to record two recent quite unsolicited tributes—one to the North Thames Gas Board, and one to the General Post Office. Speaking at the opening of the new headquarters of the British Gas Staff Association, Mr. B. Parkin, M.P. for North Paddington, remarked that the attitude of the North Thames Gas Board and its staff towards the consumer was really striking, particularly to anyone who experienced it for the first time. 'I am astounded at the spirit of friendliness and co-operation at all levels in the Board's organization,' he added, implying that this happy state of affairs was due, at least to some extent, to the good industrial relations to which the B.G.S.A. and the other staff organizations contributed by their broad-minded approach to joint consultation and negotiation. News of the other bouquet comes from the Postmaster-General, who has received a letter from a Londoner who was unsuccessful in his application for a telephone because of the shortage of lines. In the course of his letter he says: 'I would like to draw your attention to the fact that this is the first time I have ever received such courtesy when wanting something of a public utility, and never before have I known people so anxious to please, especially when unable to do so. I trust that this will eventually become the model on which all Government Departments will base their dealings.' Dr. Charles Hill, in reply, wrote: 'How very kind of you to have written to me about the courteous treatment you had from my people, even although they could not give you what you wanted. As there is nothing we should like better than to be able to say "yes," it is at least comforting to know that our "no" has been said as kindly as possible. I shall gladly pass on your remarks to the staff concerned, whom I know will be most encouraged by them.'

SCHOOL FOR COKE SALESMEN

THE demand for gas coke and other solid smokeless fuels will certainly increase when the Clean Air Act comes into force and, as a result, the present shortage of home-produced solid fuel will become more pronounced. One very useful means of mitigating this shortage will be to ensure a much more efficient use of gas coke. The handling of this problem will depend considerably on the technical ability of coke sales staff, and therefore, it is desirable that gas coke salesmen should have the best possible training for their work.

An article on the training of gas coke salesmen appears in the July issue of *Gas Coke News* published by the Gas Council. The article states that not only must the salesman have an extensive knowledge of the fuel he sells and its suitability for various applications, but he must also be acquainted with coke-burning appliances for all purposes and with the methods for investigating any difficulties or complaints which may arise in their use. It follows that a man who has completed a comprehensive course of technical training will be far more suitable as a coke salesman than the type of person with well-brushed hair, a smooth tongue, and no special knowledge, that most people associate with the name 'sales representative.'

At present a number of gas boards are carrying out technical training for their own personnel, and advanced training courses are arranged from time to time by the Watson House Centre. The City and Guilds of London Institute, in conjunction with the Coal Industry Society, with the full support of the Chamber of Coal Traders, the National Coal Board, the Gas Council, and the Coal Utilization Council, have inaugurated a course of instruction and examination in 'Solid Fuel Production, Distribution and Utilization'. The course consists of two years' part-time study, two hours on each of two evenings per week, or the equivalent in part-time day attendance. At present this course is being held only at the Sir John Cass College, 31, Jewry Street, London, E.C.3, but other technical colleges are to hold the course where there is sufficient demand for it.

The National Industrial Fuel Efficiency Service has sent out to 14,000 industrial coal consumers a message urging them to have all their boiler operators trained as the quickest way of saving fuel. Technical colleges throughout the country are willing to implement courses, starting in September, in preparation for the City and Guilds Certificate examination next year, while N.I.F.E.S. is organizing a system of training to be given at work and to be supplemented by a home study course, which will start in October. Firms are being asked to make early contact with their nearest technical college and with the service, so that everything may be ready for a prompt start in September and October.

Personal Notes

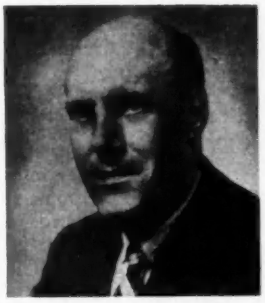
COUNCILLOR G. A. SMITH, after having represented Peterborough on the Eastern Gas Consultative Council since its formation in 1948 has declined to be nominated again when his term of membership expires on August 1.

MRS. H. S. MAIR, M.A., of Seaford, Sussex, has been appointed Deputy Chairman of the South Eastern Gas Consultative Council in succession to MRS. D. N. RATHBONE, of Oxshott; and Councillor MRS. B. J. SHELL, J.P., of Melksham, Wiltshire, has succeeded MISS J. STEPHEN, of Bristol, as Deputy Chairman of the South Western Consultative Council. There is no change in the Deputy Chairmanship of the other 10 Councils.

MR. RONALD MASON, Assistant Station Engineer at Hollacombe Gasworks, Torquay, is leaving to take up a post with the Ministry of Fuel and Power at Carlisle. Entering the gas industry at Kendal in 1925, he was appointed to Teignmouth gasworks in 1943, being transferred to Torbay in the present year. As a farewell gift from his colleagues at the Hollacombe works he has been presented with a television table, the presentation being made by the Station Engineer, Mr. D. J. Maunder.

MR. W. A. LLOYD-DODD, at present Industrial Manager of the Tyneside Division of the Northern Gas Board, has been appointed Industrial Gas Officer to the Southern Gas Board, with effect from October 1. The Southern Gas Board also announces the appointment of four Sales Managers: MR. G. A. BURCH, ASSOC.M.INST.GAS E., formerly District Service Manager, Birkenhead Undertaking, North Western Gas Board, to be Sales Manager, Southern Group, Central Division, with effect from August 1; MR. S. R. CARR, at present Group Sales Superintendent, Aylesbury and District Undertaking, Northern Division, Southern Gas Board, to be Sales Manager, Oxford Group, Northern Division, with effect from August 22; MR. J. H. WYSS, at present Fitting Superintendent, Southampton and District Undertaking, to be Sales Manager, Northern Group, Central Division, with effect from September 1, and MR. J. L. GORBELL, formerly Sales Superintendent, Southampton District, to be Sales Manager of the Southampton Group with effect from July 1.

MR. PHILIP RICHBELL, Divisional Distributing Engineer, East Surrey Division, South Eastern Gas Board, retired at the end of July after 48 years in the gas industry. He will continue for a time to act as Consultant to the East Surrey Division on major distribution schemes. He commenced his career in May, 1907, as a personal pupil of the late Dr. Charles C. Carpenter, Chief Engineer of the South Metropolitan Gas Company. During his six years pupilage, he gained practical experience in every department of the Company, and in May, 1913, was appointed Assistant Engineer to Mr. H. C. Head, Engineer and Manager of the Winchester Gas and Water Company. In November, 1918, he was appointed Assistant Engineer to the Sheffield Gas Company, and in November, 1920, Assistant Distribution Engineer and Sales Manager of the Croydon Gas Company. He was awarded in 1934 the Milbourne Silver Medal and Institution of Gas Engineers Bronze Medal for a paper on distribution presented to the London and Southern Junior Gas Association. As from January 1, 1940, he was appointed Distribution Engineer of the Croydon Gas Company. When the industry was nationalised on May 1, 1949, he was



appointed Divisional Distributing Engineer of the East Surrey Division of the South Eastern Gas Board. Mr. Richbell was President of the Association of Public Lighting Engineers for 1950/51. He held the position of Deputy Chairman of the Croydon Gas Company Sports Club for a considerable number of years, and in 1938 was elected Chairman, which position he retained until 1945. His family has recently completed a century of service in the gas industry, and his name will continue in the industry through his nephew, Mr. P. P. Richbell, B.A. (HONS.) LL.B., CANTAB., who is at present in the Solicitor's Department of the Board.

Obituary

MRS. W. E. GIBBONS, O.B.E., J.P., wife of Colonel W. E. Gibbons, Chairman of Gibbons Brothers, Ltd., has died after a short illness. Colonel Gibbons is also this year Chairman of the Council of the Society of British Gas Industries.

MR. THOMAS REGINALD SEWELL, Chairman of the Sunderland Gas Company until nationalization, died in hospital on July 29, aged 70. He was Chairman and Managing Director of Sir Hedworth Williamson's Limeworks, Ltd., and agent to Sir Hedworth. Mr. Sewell was born in Cavan, Ireland, and went to Sunderland as a boy at the turn of the century. He was educated at Wellingborough School and Armstrong College, Newcastle, where he graduated with a B.SC. degree. After a time as a civil engineer, he joined his father—then Chairman and Managing Director of the limeworks—as assistant agent to Sir Hedworth. On his father's death 29 years ago, he succeeded him. In the 1914-18 war he was awarded the M.C.

Diary

September 2.—WALES G.C.C.: Town Hall, Llandudno, 11 a.m.

September 6.—SOUTH EASTERN G.C.C.: Caxton Hall, Westminster, 11 a.m.

September 7.—SOUTH WESTERN G.C.C.: 34, Bridge Street, Taunton, 11 a.m..

September 12-14.—GAS COUNCIL: Gas Sales and Service Conference. 'Heads of Ayr' Holiday Camp, Ayr. (For final draft programme see 'JOURNAL', July 20, p. 209.)

September 13-16. — ASSOCIATION OF PUBLIC LIGHTING ENGINEERS: Annual Conference, Folkestone.

September 19. — WEST MIDLANDS G.C.C.: Committee Room, Gas Offices, Edmund Street, Birmingham 3. 2.30 p.m.

September 19-20.—EASTERN SECTION, I.G.E.: Annual General Meeting, Chairman's Address, W. A. Evetts; 'Some Problems involved in the Manufacture and Distribution of Gas,' B. Wilkinson; Grand Hotel, Sheringham.

September 21.—MANCHESTER JUNIORS: Visit to K.L. Cranes, Ltd., Letchworth.

September 22. — STANTON IRONWORKS CO., LTD.: Mr. Geoffrey Lloyd, Minister of Fuel and Power, opens coke oven extensions.

September 22.—SCOTTISH ASSOCIATION OF GAS MANAGERS: Annual General Meeting, Town Hall, Inverness. Autumn golf and bowls competitions on September 21; annual outing on September 23. Golf entries by September 7 to W. P. Rae, 82, Gordon Street, Glasgow (not Inverness).

September 24.—EASTERN JUNIORS: Presidential Meeting, Norwich.

September 29.—NORTH THAMES G.C.C.: Westminster City Hall, W.C.2. 2.30 p.m.

October 4.—SOUTH EASTERN G.C.C.: Caxton Hall, Westminster, S.W.1, 11 a.m.

October 5.—MIDLAND JUNIORS: Report on the Paris visit. Birmingham.

October 19.—SOUTH WESTERN SECTION, I.G.E.: Annual General Meeting. Address by Chairman, W. B. Claridge.

November 21.—EASTERN G.C.C.: Connaught Rooms, Great Queen Street, Kingsway, W.C.2. 2 p.m.

The telephone exchange serving the 'GAS JOURNAL' offices has been changed from Central to FLEet Street. The numbers—2236 and 2237—remain unaltered.

Compoflex Co., Ltd., announces that its Oldham factory will be closed for a second holiday week from August 13 to 21 inclusive. The Wimbledon factory will, however, be in production throughout the summer.

The Edinburgh Division of the Scottish Gas Board is making good progress with its 'Complete Kitchen Service,' a scheme whereby three new appliances are installed, giving cooking, water heating and home laundering, at a cost of 2s. 6d. per week.

Gas in the Glass Industry*

By H. R. HEMS, Assoc.M.Inst.Gas E., M.Inst.F. ‡

IT has been my privilege over the years, as an outside observer, to have watched the progress of the glass industry, its progressive emergence from the early unsatisfactory conditions of production to its present state, and I would not even now, with the very much improved production techniques, expect glass manufacturers to admit that it was yet their ideal, or that it had reached its highest state of efficiency.

The unsatisfactory conditions in and surrounding a glass factory were, in the main, attributable to the siting, transporting to its point of use, and the actual use of solid fuel with its resultant ashes and smoke. Modern methods of fuel application and improvement in the design of furnaces using producer gas, oil, town gas, and electricity, for the melting and finishing processes, have all combined to provide very different production and fuel utilization conditions than was the case not so many years ago.

When I first turned my attention to the use of town gas for industrial heating processes and was introduced into the mystery of, say, what a 'lehr' was used for in a glassworks, and allowed the opportunity of inspecting a 'glass house,' my recollection of the conditions of blackness and smoke then prevailing was anything but favourable and it occasioned a feeling of surprise that some of the magnificent results of the glass worker's art could be produced under such conditions. The replacement of an old coal-fired lehr with a gas-fired unit was certainly a revolution at that time—about 1913—and meant that a fuel was available at will, to provide precise control of temperature, impossible with solid fuel at that time, and ensured that the annealing process for glass ware placed in the lehr was independent of manual control and skill. The uncertainties associated with annealing were thus removed and smokeless operation attained.

Those remarks constitute a brief look into the past but probably illustrate what has been taking place in the glass industry, and most other industries for that matter.

Let us have a closer look at the glassworks and the processes carried out inside, which need heat in some form and for which a fuel has to be provided.

Glass Melting

Probably throughout the industry the greatest use of fuel is in those large furnaces which are a feature of most glassworks and contain in their design and structure provision for a number of pots in which the glass is melted—*i.e.*, founded and plained, to the requirements of the particular article to be 'blown' or fashioned. When ready, the glass blower and his assistant take over and work the glass until the melt is practically exhausted. The operation of such furnaces must, of necessity, be continuous by reason of the huge brickwork structures and high temperature required.

Earlier heating of such furnaces was by direct coal firing. Improved methods utilizing waste heat for the pre-heating of air supplies required for combustion were gradually adopted but I think it can be generally accepted that producer gas, either from what is termed an 'internal' producer, which is an integral part of the furnace, or 'external,' the use of a separate producer plant, is now the principal method of firing, apart from the use of oil fuel.

Coke oven gas or town gas can be, and is, successfully used for these furnaces but, of course, only where the price is economic compared with producer gas or oil fuel. Coke oven gas and/or town gas are also used as 'admixture' gases. Straight town gas has many advantages for single pot furnaces in the glassworks and for demonstration or student purposes, say, in an art school. An example is the three-pot furnace in use at The Stourbridge Art School.

Pot Arching

Having to memorize so many terms connected with processes in a wide variety of industries has always caused me some headaches. Those engaged in the particular trade always introduce so easily their particular favourite as though one knows all about it and are very surprised when one asks, for instance, 'do you mind telling me what "pot arching" is.' Simply put, the pots referred to earlier have to be brought up to temperature very slowly and placed in the melting furnace, as nearly as possible at the temperature of the furnace, otherwise there can be disastrous results, and pots are expensive items. Separate coal-fired furnaces were used earlier for this purpose and for each 'arching' I am told 5¼ tons (approximately) of coal, could be used. In Stourbridge, with one exception, all pot arches have been re-built to use town gas, with a corresponding saving of that amount of coal burned directly, with its resultant smoke and ashes.

The use of single pot furnaces for melting has the advantage of eliminating the preliminary process of pot arching as the pot can be brought up to temperature and continue in use for the melting operation in the same setting.

Glory Holes

Loss of heat during blowing and shaping of glass was put back originally at the blower's will by his gently manipulating the partly-formed article in the mouth of the melting pot, the glass absorbing the radiant heat available. Separately heated glory holes are now, in the main, used for the re-heating process, and with the use of more refined and controllable fuels, gas takes a leading place in this process.

Lehrs and Kilns

As already mentioned, these furnaces, or lehrs, are used for annealing the glass articles after blowing and the ware is transferred as speedily as possible from the blower's pipe to the charging end of the lehr, now generally of the continuous type, and heated by either gas or electricity—the controllability obtained at the relatively low temperature of 500°C. justifying the use of such fuels against earlier methods of solid fuel usage and eliminating the pollution of the glass house with smoke and ashes. Similar remarks apply to the static kiln used for annealing purposes.

An idea of the magnitude of the use of gas in the Stourbridge area is gained from the annual gas consumption of the firms constituting the glass industry in that district—140 mill. cu.ft. (630,000 therms)—in the following approximate proportions:—

	Mill. cu. ft. per annum
Glory holes	42
Pot arches	31
Glass melting	30
Lehrs and kilns	21
Cracking off and edge fusing	2
Acid and ring heating, etc.	14
Total	140

While Stourbridge is synonymous with glass, particularly for table and similar ware, glass plays such a vital part in our everyday life that we also have to look at many other parts of the country for a wider and ever expanding range of processes connected with glass products in most of which heat is required and in many of which gas is used successfully. In some, the manufacture of electric lamp bulbs, for instance, for certain processes it is the only fuel which can be applied, as we confirmed when we tried to find substitutes to meet either gas shortages or actual temporary cut off of supplies during the blitz conditions of the last war. It is only possible to mention here the trades and processes with which some of these are connected and in every case it is known that gas is successfully used:

Fore-hearth or feeders, for melting furnaces to maintain the glass at the requisite temperature during transmission from the tank to the multiple glassware moulding machines.

The bending of plate glass and safety glass for the motor car industry.

The production of chemical and other industrial glassware—a continuously growing industry.

The cutting off and finishing of electric lamp bulbs,

* From a paper to the National Smoke Abatement Society, West Midlands Division, April 21.

‡ Industrial Gas Officer, West Midlands Gas Board.

fluorescent lamps, television tubes, and similar items.

The moulding of optical lenses in rotating type furnaces.

An indication of the wide use of gas for the processes listed will be gleaned from the following.

The Tyneside Division of the Northern Gas Board serves four major glassworks, producing mainly pressed glass, including television screens and heat-resisting ware, but also some blown glass and fluorescent tubing. Their collective annual consumption is of the order of 1,200 mill. cu.ft. (6 mill. therms). In addition, other smaller consumers use gas in the manufacture of radio valves, glass ampules, etc.

Gas is also used for melting, for tank feeders, annealing and auxiliary processes, possibly the most unusual feature in this area being the use of gas for the firing of 12 pot furnaces and tank furnaces of appreciable size. Gas is also used for pot arching and the firing of tank blocks, one installation of the latter being of some interest in that the blocks are first dried in compartments heated by means of a gas-fired central heating system and then fired in a gas-heated furnace.

For similar processes to those mentioned—*i.e.*, glass tank feeders, annealing lehrs, pot melting furnaces, fire polishing, glory holes, automatic machines for electric bulb manufacture—I understand the North Eastern Board sold 671,528,000 cu.ft. (3,357,640 therms) to the glass industry in its area during the year 1954.

In connection with the production of electric lamp bulbs, automatic machines are used for the cutting off and sealing processes, each bulb being brought at selected time intervals into the region of a ring of flame produced by a gas burner. This burner is of a type into which much ingenuity has gone, as it has to function with the precision of a machine tool. It is successful in practically every known glass producing factory. I have seen many in this country and in Holland.

Incidentally, I understand that the volume of gas used in the manufacture of electric lamps and television bulbs accounts for about 25% of the industrial gas load of the Tottenham Division of the Eastern Gas Board.

I am permitted by Chance Bros., Ltd., of Smethwick, and Pilkington Bros., Ltd., to make reference to the efforts in their organizations to eliminate smoke and improve the conditions inside their famous glassworks. They use town gas for the fore hearth and pot arches, and have selected town gas for one of their large-scale melting furnaces, taking 5,000 cu.ft. of gas per hour at St. Helens and, I understand, are installing another, having selected this form of fuel for its cleanliness. They are extremely alive to the problem of smoke abatement and are equipping all normal boilers with automatic stokers which they have found reduce the smoke nuisance. They have also introduced, on their glass melting furnaces in Glasgow, a system of flue cleaning, by which the soot and rust from the flues is blown into a water tank and the material later removed as sludge.

Apart from its rather specialized contribution to the fuel economy and productive efficiency of the glass industry, gas has been quietly and unobtrusively making a contribution to the whole fuel economy of the country over the past forty years or more.

So with industry—the march of science—the mechanization of so many industrial processes has meant that the use of solid fuel has been gradually replaced by gaseous or liquid fuels or electrical energy for most of the processes requiring heat, carried out within a factory, and for space heating and process work. In fact, everything, apart from large-scale steam raising and some exceptionally large furnaces for specialized industrial processes.

This movement has meant that increased production has been obtained efficiently and with the release of the minimum amount of smoke. Indeed, it is almost true to say that without these refined fuels modern industry, particularly where 'line' production is the order, could not have reached even its present state of perfection.

Changing trends within industry—*i.e.*, the replacement of non-ferrous castings by pressings, and the substitution of sand casting by die casting, particularly in the aluminium industry—have demanded the use of the refined fuels against the uncertainty of solid fuel working.

To illustrate this, as you are meeting in the area of the West Midlands Gas Board, I do not think I can do better than refer to the growth of the industrial gas load of Birmingham, Coventry, Wolverhampton, and all the other undertakings now merged into the control of the Board, which in the first year of nationalisation reached the tremendous figure of 26,220 mill. cu.ft. (119,402,207 therms).

The growth from 1949-54 is seen in the following summary:

March	1949	..	23,900	mill.	cu.	ft.	.. 108,847,000 therms
"	1950	..	26,220	"	"	"	.. 119,402,207 "
"	1951	..	29,310	"	"	"	.. 133,320,233 "
"	1952	..	31,100	"	"	"	.. 141,142,600 "
"	1953	..	30,000	"	"	"	.. 136,666,500 "
"	1954	..	31,300	"	"	"	.. 142,338,800 "

A 30% increase in five years. I suggest this is a tribute to the value of gas as an industrial fuel which has not only successfully met the exacting conditions of modern production conditions, but has achieved this without detriment to the working atmosphere of the factory or its surroundings.

The recent emphasis placed by the Minister of Fuel and Power on the greater use of automatic methods by the Austin Motor Company at Longbridge is an instance. The Minister stated that the Austin factory of the British Motor Corporation at Birmingham had increased its consumption of gas per worker by 180% since 1939, and its output has trebled. There is every indication that the financial year just closed will show a further notable increase in the Board's industrial sales.

The production of gas is carried out at an overall efficiency of 85%—*i.e.*, that percentage of the total heat in the original coal is available in the gas, coke and other valuable by-products resulting from the coal carbonization or distillation process carried out on a modern gasworks. The magnitude of the operation in a large plant where hundreds of thousands of tons of coal per annum are carbonized must, of necessity, call the attention of the general public to the proximity of the works, although from the efficiency figure quoted, it will be obvious that air pollution is at a minimum.

In conclusion, notwithstanding the progress made, I would mention that the gas industry is constantly active to improve further the efficiency of application of gas to industrial processes and so contribute to the nation's wealth in the field of industrial productivity and at the same time assist in reducing further the smoke nuisance.

BRITISH CHEMICAL PLANT

The continued growth of the chemical plant industry over the past two years is reflected in the 1955 edition of *British Chemical Plant*, the illustrated directory of members of the British Chemical Plant Manufacturers' Association. It is a biennial publication, the last edition having been issued in May, 1953. Although first issued in 1922, it did not appear in its present form until 1947, since when it has nearly doubled in size. It has three sections—a list of members with their addresses and, where they have wished to publish them, the names and addresses of their overseas agents; an illustrated section consisting of members' advertisements; and a classified index of products and services prefaced by advice to enquirers and followed by a key in French, German, and Spanish.

The Association now has 211 members against 192 in 1953, and the directory has grown in size from 356 to 393 pages, with 121 entries in the illustrated section against 109, 274 pages in the illustrated section against 246, and 1,325 headings and sub-headings in the classified index against 1,204. Five thousand copies of the directory have been printed, and distribution is being made to chemical and allied manufacturers at home and overseas on the basis of mailing lists compiled by the Association. A limited number of copies are being held by the Association to meet requests from chemical plant users who will be supplied with copies free of charge on application to the Secretary at 14, Suffolk Street, London, S.W.1. The publication is not available through booksellers.

The B.C.P.M.A. is the trade association of British firms engaged in the design, manufacture, and supply of chemical plant—*i.e.*, all plant, equipment, and accessories utilized in processing industries where materials undergo a change of state or composition. Formed in 1920 it maintains close relations with the Government, the Association of British Chemical Manufacturers, and kindred bodies with which it resolves many problems of common interest, and with appropriate authorities and organizations overseas. One of its daily services is to provide information on the sources of supply of plant, and an introductory note invites readers who cannot find the information they require in the directory to call at or write to 14, Suffolk Street, where qualified staff are available to assist them.

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Instrumentation and the Gas Industry

PART 6

By A. LINFORD, B.Sc., A.M.I.C.E., and G. C. FARMER, Assoc.M.Inst.Gas E.

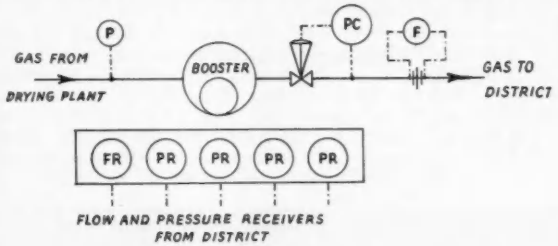
(We conclude this article, Part 1 of which was published in the 'JOURNAL' of July 6, and Parts 2-5 in consecutive issues.)

IN the preceding parts of this article we have surveyed the whole of the subject of gasworks instrumentation from the receipt of coal through the gasmaking processes and the ancillary plant up to the holders. In this, the last part of the article, a few brief notes are given on the applications of instrumentation to the distributing side.

GAS DISTRIBUTION SYSTEMS

Automatic Control of Pressure

All gasworks, whether operating in conjunction with the grid system or distributing gas to a local area, must employ a system of pressure control to ensure that the consumers receive a satisfactory supply at all stages of load variations. District governors of the direct acting type have been in use since the earliest times and recent trends in this direction follow on the same lines as in retort house governing, the use of hydraulic and pneumatic pressure controllers becoming common practice. See 'Instrumentation for the Carbonizing Process—Measurement and Automatic Control of Gas Pressure.'



P. Pressure measuring inst., P.C. Automatic pressure controller, P.R. Pressure receiving inst., F. Flow measuring inst., F.R. Rate of flow receiving inst.

Fig. 28. Booster plant and district mains instrumentation.

Measurement of Flow

Flow measurement at booster stations is also important, since this gives the operator of the plant a continuous reading of the prevailing load conditions and enables the required pressure to be placed on the various booster plant. Flow measurement equipment for this application is invariably of the differential pressure form, employing an orifice plate working in conjunction with a rate of flow indicator.

Transmission Systems

To ensure that the district is being adequately supplied with gas, a system of pressure transmission from selected points in the distribution system to the booster house is employed. In view of the distances involved, electric transmission of the pressures is always adopted, and a number of systems are available.

One of these employs a variable duration principle. By mechanical means, at regular intervals an electric contact is made which persists for a period of time directly proportional to the value of the pressure being transmitted. In effect, the receiver measures the duration of each impulse and registers this in terms of pressure. During the time that the transmitter contact is open, the previous pressure reading is maintained by the receiver, so a continuous registration of pressure is obtained. The advantage of the variable duration impulse system is that it is not affected by changes in line wire resistance, contact resistance and other electrical variables.

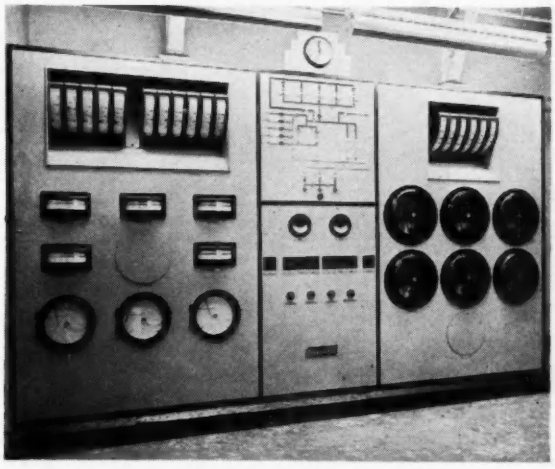


Fig. 29. Booster house panel metering gas out of works.

Progress in the adaptation of electronic principles to instrumentation has led to the development of electronic circuits for long distance transmission of pressure and other variables. A system of this description now in common use incorporates the familiar 'null-balance' idea. In the transmitter a pivoted contact arm, carrying a coil working in a pot magnet, is actuated by the pressure measuring element through a spring. A change in pressure causes the contact arm to impinge on one or other of two contacts, depending on whether the pressure has increased or decreased. The effect of closing

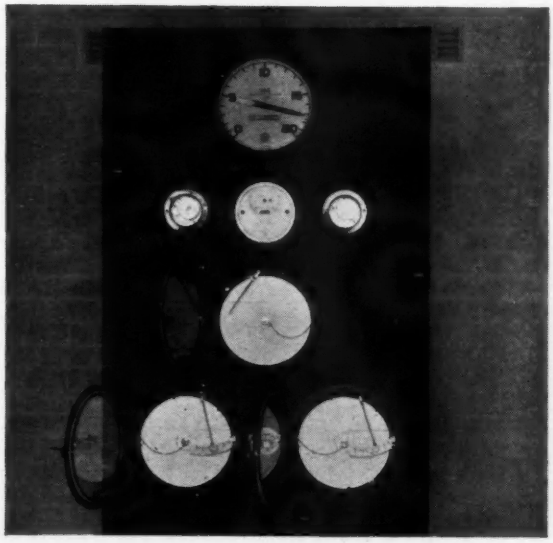


Fig. 30. Panel in district governor house at Liverpool.

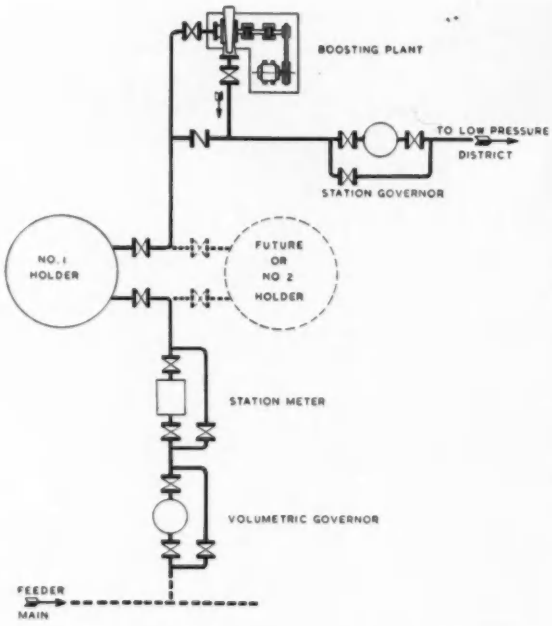


Fig. 31. Typical low-pressure holder station.

either of the two contacts is to energize an electronic circuit, the output of which alters the torque produced by the pot magnet in the direction required to bring the contact arm back to its central position between the two contacts, under which condition the pot magnet torque balances the torque imposed on the contact arm by the pressure measuring element. The current flow round the circuit is proportional to the torque, and therefore to the pressure being measured, and this current flow is registered by the receiving instrument in pressure units.

As in the case of the variable duration impulse system, this system also is independent of line wire resistance and supply voltage changes.

To operate a gas grid system economically, it is essential that the pumping machinery is operated at its optimum load factor for as long a period as possible. The technique employed is to operate the grid main at relatively high pressures between 5 and 200 lb. per sq. in., the grid mains connecting the producer stations with towns and villages to be supplied with gas.

Gas is withdrawn from the grid at reception stations where the pressure is reduced and the gas is fed into storage holders. These holders then feed the local low pressure gas distribution system and accommodate fluctuations due to load demand. In some cases these local holders are either entirely automatic or only intermittently manned, and this has entailed the need for remote indication of readings of pressure, flow, gas holder height, temperature, and the provision of alarms and switch gear for the operation of boosters. As long distances may separate the control room from the reception stations, the most convenient method of transmission is over G.P.O. telephone lines, and economy demands that the minimum number of lines be employed for this purpose. The requirements outlined above have been met by the development of coding systems which enable as many as five or six variables to be sent over a single pair of lines.

In order to maintain control over the grid, the gas withdrawal into the receiving stations is flow controlled, the flow rates being altered either automatically from a central control room or by a local operator on telephoned instructions.

For this purpose some form of constant volume governor is usually employed, using a differential generated by an orifice plate located in the grid main. The differential pressure is controlled by a relay system, as described under heading 'Instrumentation for the Carbonizing Process—Measurement and Automatic Control of Gas Pressure.'

Recent developments in this direction have included the use of automatic pneumatic control equipment which operates in conjunction with a flow measuring instrument recording tne flow into the local holder. The employment of the pneumatic system enables a wider range of automatic control to be obtained while retaining the feeder tight shut off when required. One merit of the latter system is the considerable reduction in the dimensions of the equipment employed.

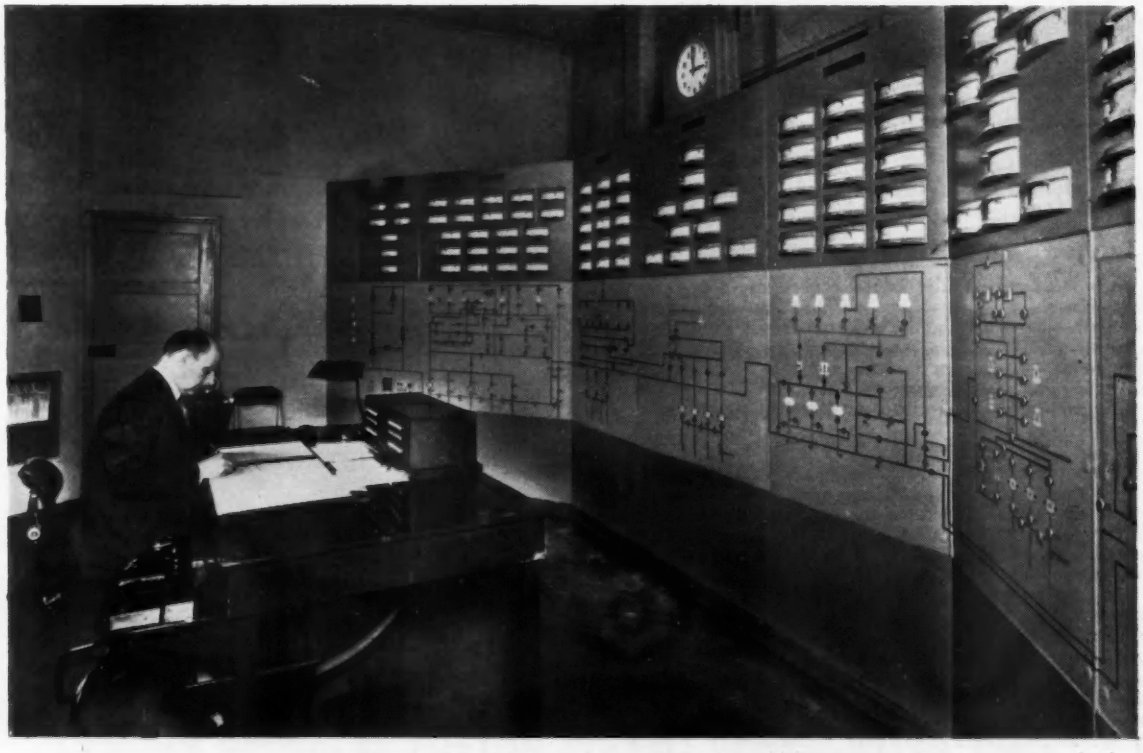


Fig. 32. Control room of a large gas grid scheme.

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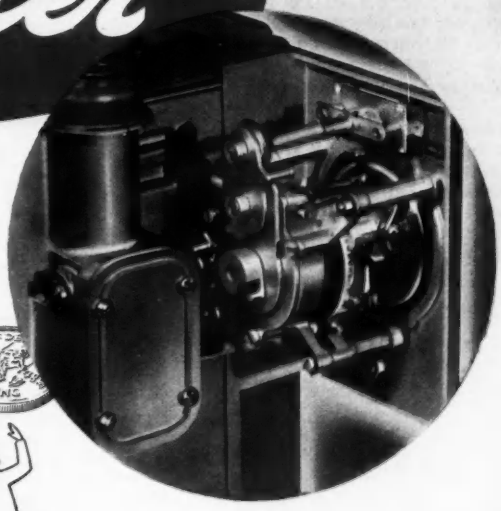

The pre-payment attachment on the Flomaster makes the theft of gas or money impossible without leaving clear evidence of wilful damage. Yet it offers easy access to collectors. Like the meter itself, the attachment is made from precision pressure die castings, ensuring very accurate operation. The mechanism is easily adjusted for variations in the price of gas. The outer case is rugged but neat. In short, the pre-payment attachment keeps up the all-round high standard attained by the Flomaster meter.

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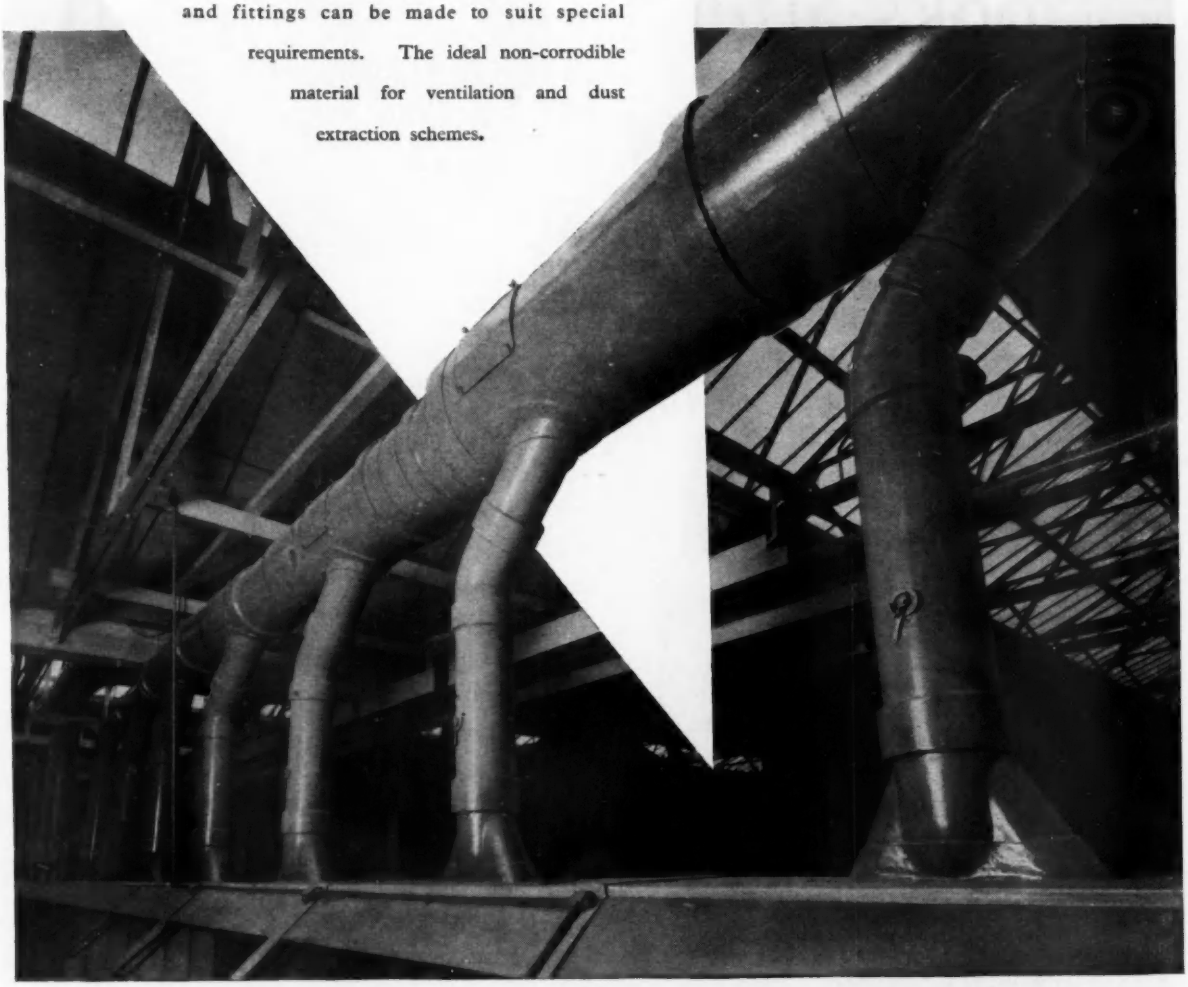

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F.9

Oxide Purification in the Midlands*

This paper by F. Grocott, Engineer and Works Manager, Saltley, West Midlands Gas Board, describes the behaviour of two different oxides in purifiers of conventional box design at Saltley gasworks over a period of five years.

THE dry purifying plant at Saltley consists of five streams, each stream having six boxes, 32 ft. by 37 ft., containing 3 ft. 6 in. of oxide. The boxes are of the overhead type with water-sealed 'U' valves and the whole installation is commanded by a 7-ton Goliath crane. Backward rotation, downward flow, regular changing round, and a regular system of emptying boxes are practised, with a double fouling system. A mixture of coal gas, producer gas, and water gas is purified and the proportions of the mixture vary according to the plant repair programme. Each year since 1949, however, the total volume of gas purified and the total weight of sulphur removed have been similar. A regular system of changing boxes has been maintained. It has been possible to draw certain conclusions as to the behaviour of two prepared oxides, styled 'A' and 'B,' and to discuss the characteristics of these oxides.

Particular emphasis is given to the effect of heat dissipation from the oxide to the atmosphere on the moisture in oxide during fouling, and the effect moisture has on the capacity of oxide for extracting sulphur. The relationship between the bulk density of a prepared oxide and its propensity for developing back pressure is also discussed.

Although purification costs represent a small proportion of the cost of gas into holder when considered as cost per therm, in terms of cost per annum considerable sums of money may be involved and a knowledge of all the factors affecting purification costs can result in appreciable economies.

Radiation Characteristics and Moisture in Oxide

Heat Dissipation

Moignard[1] states that the arrangement of opportunity for radiation and convection may well be the most important technical aspect of purifier design in so far as it affects operating performance.

Operational difficulties due to inefficient absorption of hydrogen sulphide or revivification *in situ* can usually be traced to the design of the installation or to the oxide used. The relations between inlet temperature, outlet temperature, hydrogen sulphide concentration and radiation losses, have been investigated thoroughly and were published by Moignard[1] in 1952. His conclusions are of great practical importance and well worth repetition. He puts forward the conception of a maximum permitted outlet temperature at which gas can leave an installation without removing water by evaporation from the oxide assuming that no radiation losses occur and that the outlet gas is saturated. This temperature depends on the inlet temperature and the concentration of hydrogen sulphide in the gas. For a hydrogen sulphide concentration of 700 grains per 100 cu.ft. and an inlet temperature of 60°F., the maximum permitted outlet temperature is 74°F. For these conditions a saturated outlet gas leaving the purifiers at a temperature greater than 74°F. will remove water from the system.

A newly-prepared oxide usually begins its life in a box with a moisture content between 30 and 40%. When this oxide is part-spent or spent this moisture content may well have fallen to less than 10%. Loss of water is usually the factor limiting oxide activity. The heats of the sulphiding and oxidizing reactions are so great that if heat was not dissipated by radiation from purifier installations the moisture in the oxide would rapidly be evaporated with consequent loss of activity before the oxide was sufficiently fouled with sulphur.

Pre-war publications on purification often put stress on the importance of housing purifiers and of lagging box lids, externally or internally. With an installation of generous design and ample capacity the heat of reaction under low load conditions was often less than the radiation losses, so that it took a considerable time to warm up a box put to first taker position from last taker position, and lagging was undoubtedly necessary.

Post-war tendencies have been to increase the load on existing purifier installations so that, during the summer months at least, operational difficulties lie in the ability to radiate heat rather than the need for conserving heat by lagging. Various authors have claimed better operational results by increasing the load of their installations as measured in terms of the 'R' ratio. Whether such an increase would have the desired effect may depend entirely on the ability of the installation to lose sufficient heat by radiation.

Accepted practice for the operation of purifiers was to maintain the temperature of the gas leaving the first three takers at between 70 and 90°F. in order to assist the sulphiding and oxidizing actions. Avery[2] gives the optimum temperature as measured in the gas stream as 90°F. This conflicts with the necessity for maintaining low inlet temperatures for the retention of moisture. Hopton[3] has shown that the temperature in the oxide is much higher than the temperature of the outlet gas. 'Proteus'[7] gives figures showing that the activity of the oxide rises gradually over a range of oxide temperatures from 60 to 110°F. Dunkley[4] in 1920 showed that the activity of oxide depended on the moisture content and that below 10% moisture there is a rapid fall in activity and below 6% the activity becomes negligible. Spears[5] has produced similar curves from his experience. In the Interim Report of the Gas Research Board[6] the importance of preventing the moisture content of the oxide in the purifiers falling below 10% is stressed.

Taking the above facts into consideration, together with the special case of the Nechells towers, dealt with in detail by Warr and Pickering[8], when any purifier installation is designed, high radiation characteristics should be aimed at together with simple means for reducing the heat loss by radiation during very cold periods. Such periods, however, often correspond to high gas loads when higher radiation losses may be required to conserve moisture.

Moisture in Oxide in Saltley Box Purifiers

As previously mentioned, it is believed that loss of efficiency of oxide towards the end of the first fouling and second fouling periods is due to the moisture content of the oxide being reduced to a point below which the oxide loses its activity. An examination of the history of the moisture in oxide during the first and second foulings is, therefore, likely to be most informative.

It has been the practice at Saltley to store separately the four types of oxide, new oxides 'A' and 'B' and part-spent oxides 'A' and 'B,' and never to mix any of these four types for filling boxes. Thus the history of each kind is known and it is possible, by averaging the analyses obtained over the years, to obtain figures which give a fairly accurate picture of the behaviour of each type of oxide. (The figures are tabulated and explained in the paper.)

The first point which arises from the figures is that, although the part spent oxide was only fouled to the extent of 36.1% sulphur, the moisture content had fallen to 7.5%. The continued fouling of this material under conditions where water losses due to evaporation and condensation passing to the syphons inevitably occur, would not have proved practicable. With low load conditions or with an easily-dissipated low heat of reaction it is possible that this material could have been fouled to 44% sulphur, but it would have been at considerable loss to the efficiency of the installation as a whole. In addition, it would have been economically unsound to have sold this material as spent oxide.

Each installation has its own moisture conserving characteristics for the varying conditions under which it works, and for the Saltley boxes the period required to reduce the moisture content to 7.5% is about 200 days. If the hydrogen sulphide

* From a paper presented to the Midland Junior Gas Association in April of this year.

concentration in the gas increases then the heat of reaction would evaporate more moisture and this period of 200 days would have to be reduced; the period worked by each box was brought down to 185 days in order to counteract the effects of an increase in the hydrogen sulphide concentration in the gas to be purified. No appreciable diminution in the sulphur content or increase in the moisture content resulted.

The second point of note arising from these figures was the quantity of water which had to be added during disintegration of the part spent oxide. This amounted to 16.6 tons for every 122.3 tons of part spent oxide 'A' removed from the boxes during 1951 and 1952. The question may be asked, whether the average quantity of water added is sufficient. In spite of long periods of exposure in the open to varying rainfalls, the moisture content of the part spent oxide, as charged, seldom exceeded 20% over the five years covered by the tables—which leads to the conclusion that it is difficult to wet part spent oxide above this figure. Water added to part spent oxide in excess of 20% is not absorbed by the lightening agent and drains away.

Characteristics of Materials

Capacity of Absorbing and Retaining Moisture

Clephane[8] has pointed out that sulphur does not absorb moisture and that the moisture content of oxide should be expressed on a sulphur-free basis when considering its value in the reactions. Unfortunately, there is little available information differentiating between the moisture associated with the iron oxide and the moisture absorbed in the lightening agent.

An examination of the moisture contents of the part-spent and spent oxides as removed from the purifiers indicates that the spent oxide is drier on the average than the part-spent.

For oxide 'A' the sulphur-free spent oxide was wetter than the sulphur-free part-spent oxide and for oxide 'B' the sulphur-free spent oxide was almost equal in moisture content to that of the sulphur-free part-spent oxide. This may account for the ability of the spent oxide to maintain its activity in spite of its dryness as removed from the boxes when compared with the part-spent oxide as removed from the boxes.

Over the five years covered in the tables the part-spent oxide 'A,' after addition of water, absorbed more water on a weight basis than the part-spent oxide 'B,' even though each type had had equal treatment and equal opportunity for absorbing moisture. Since this comparison is on a sulphur-free basis it follows that the absorption of water depends chiefly on the proportion of lightening agent in the oxide. Oxide 'A' had a greater proportion of lightening material than oxide 'B.' It could therefore hold more moisture when new and this difference in ability to absorb water was found in the part spent oxide, though to a lesser degree.

Water Associated with Iron Oxide in Box and Tower Purifiers

The moisture closely associated with the iron oxide must remain with it throughout its working life and the losses due to evaporation should be from the lightening material. To remove water associated with the iron oxide requires high working temperatures and complete removal of water from the lightening material. Should this happen early in the working life of the oxide, owing to the coating of the oxide particles with sulphur, replacement of the water associated with the iron oxide is extremely difficult and the percentage moisture of the mixture after it has again been wetted by condensation, spraying or other methods, is little indication as to the quantity of water associated with the iron oxide upon which the activity of the material depends.

In the Saltley boxes the top layer oxide becomes desiccated as the active zone passes downwards, and water condensing on the lids and dropping on to the oxide does not renew the activity of this zone to any appreciable extent. It merely saturates the lightening material and soaks down to the active zone below it. In reaching this active zone it is evaporated and by saturating the gas, slows down the rate of removal of moisture from below the reactive zone.

In the tower purifiers there is no such mechanism for saturating the gas in the reactive zone. Consequently, the lightening material in this reaction zone is desiccated and the iron oxide loses much more of its water than is the case in box purifiers with the downward flow. The renewal of this moisture content on the upstream side of the reactive zone in box purifiers only affects the life of the reactive zone, in that it lengthens the period before loss of iron oxide moisture renders the iron oxide inactive and permits the passage of sufficient oxygen and hydrogen sulphide for the law of mass action to allow activity downstream.

In towers, the final moisture content of the oxide represents an almost complete drying out of the lightening material and a far more advanced stage of desiccation of the iron oxide, figures as low as 1% resulting.

This figure of 1% moisture was reached in a tower which had a sulphur content of 27.4%. The tower had been charged with oxide containing 41.6% moisture and 9.2% sulphur and had worked during the summer months of 1953. A temperature of 98°F. had been attained by the outlet gas from this tower when second taker during one hot June day and its minimum outlet temperature throughout its life had been 80°F. As first taker, a fortnight before it was emptied, its efficiency was:

	H_2S grains per 100 cu. ft. In	H_2S grains per 100 cu. ft. Out	% H_2S extracted
1st day as 1st taker ..	670	430	36%
2nd day as 1st taker ..	480	430	10%

The minimum moisture content for activity had obviously been passed in this instance, but the moisture content of the oxide before its final period as first taker may have been 4 or 5%.

Activity and Capacity of Materials

Activity is a measure of the rate at which the sulphiding and oxidizing reactions occur. Capacity is a measure of the quantity of sulphur the material can extract from the hydrogen sulphide in the gas during a fouling period.

Prepared oxides 'A' and 'B' during the years 1951, 1952, and 1953 were given equal opportunities to extract sulphur from the gas. Usually each set had two or three boxes of oxide 'B' in series with two or three boxes of oxide 'A.' Each box had the same opportunity to occupy first taker position, sets usually being rotated according to the 'staying' ability of the first taker. It is therefore of interest to examine the ability of each of these oxides to absorb sulphur from the gas and also to compare the sulphur-absorbing capacity of the iron oxide content of each oxide. (A table of sulphur-absorbing capacities is given in the paper.)

The figures showed that for the years 1951, 1952 and 1953 both these oxides when used in the Saltley box purifiers were more 'useful' per ton of material charged during the first fouling than during the second fouling. Under identical conditions and given equal opportunity a ton of new oxide will absorb more sulphur than a ton of part spent oxide as charged. The word 'useful' has been used in order to avoid confusion between activity and capacity. Some authors have observed a tendency with certain oxides to improve in efficiency after a preliminary fouling. An oxide can be efficient as regards activity during the early part of its fouling period and yet not be efficient as regards its capacity for the whole period. But more sulphur was removed per ton of new oxide during the second fouling than during the first fouling. This is because the part-spent oxide formed from a ton of new oxide was exposed to more gas than the original ton of new oxide. Each box was exposed to approximately the same quantity of gas and one box of new oxide formed about one and a third boxes of part spent oxide.

Back Pressure

When oxide 'B' was first used at Saltley in 1949, it caused considerable trouble owing to the development of high back pressures during the first fouling. In order to test this oxide all six boxes of one of the five sets were filled in turn with this oxide for first fouling. The high back pressures which developed considerably reduced the flow of gas through the set, and boxes had to be opened up for breaking the top layers.

The characteristic of oxide 'B' of developing high back pressure was attributed to its high bulk density. The bulk density of a material is a rough guide to the proportion of water and lightening materials. The specific gravity of iron oxide is about 5.0 and that of the water plus lightening material less than 1.0. Bulk density also depends on the physical condition of the constitutents which comprise the oxide material.

It is generally accepted that the initial water content of an oxide largely functions as an inert which will evaporate and leave room for the sulphur extracted from the gas, thus preventing back pressure. It is therefore interesting to examine the quantities of water and sulphur involved in each fouling and to relate these quantities to the actual back pressures which have developed in the two prepared oxides 'A' and 'B.'

Taking figures derived from the two years working results for 1949 and 1950, and assuming that the space originally occupied by one ton of water would be eventually filled with two tons of sulphur, since the specific gravity of sulphur is about 2.0, the following figures are obtained:—

First Fouling of 100 tons of New Oxide

	Oxide 'A'	Oxide 'B'
Loss of water	38.0−7.0=31.0 tons	30.0−10.2=19.8 tons
Weight of sulphur equivalent in volume	62.0 tons	39.6 tons
Gain in sulphur	38.2 tons	28.9 tons
Space remains for	23.8 tons of sulphur	10.7 tons of sulphur

If back pressure was caused solely by deposition of sulphur, it would be twice as likely to occur in the first fouling of oxide 'B' as for oxide 'A.' In practice, drastic rises in back pressure occurred when oxide 'B' was undergoing first fouling and no such trouble was evinced by oxide 'A.' As the moisture evaporates in the lightening material, the cells of this material contract and leave space for the passage of gas through it.

The sulphur deposited with the iron oxide is insufficient in oxide 'A' to cause back pressure, but it does so in oxide 'B' in spite of the fact that theoretically ample space is left by the evaporation of the moisture.

It is concluded that sufficient moisture in new oxide is needed to prevent back pressures developing during the first fouling. Where single fouling is practised, this is important. The fact that high back pressures are not experienced, even with an oxide of high bulk density, during second fouling is a strong point in favour of a double fouling system.

Operational Considerations

Gas Inlet Temperature

The importance of maintaining the lowest attainable inlet temperature to an installation in which there is any tendency for excessive drying out of the oxide is not generally appreciated, and figures are given to illustrate the different water losses with an inlet-gas temperature of 60°F. and 75°F.

If one mill. cu.ft. of gas saturated at 60°F. passes through moist oxide, this volume of gas will carry into the system a total heat of 1.433 mill. B.Th.U. The heat liberated by the reaction can be calculated as 2.807 mill. B.Th.U., so that the total heat carried by the gas after completion of the reactions would be 4.240 mill. B.Th.U.

Assuming that a temperature balance has already been reached in the system, then the temperature of the gas in its unsaturated condition immediately following the reactions will be lowered due to evaporation of moisture from the oxide, although the total heat in the system will remain the same. The final temperature of the gas will be that at which one mill. cu.ft. of gas when saturated has a total heat of 4.240 mill. B.Th.U. From the tables this can be determined as 99.6°F. This will be the outlet temperature of the gas provided that heat is not lost from the system by radiation.

The quantities of water carried into the system at 60°F. and the water carried out at 99.6°F. can be determined from tables, and the water formed in the reactions can be calculated. It is then possible to obtain a water balance for the system.

It is shown that 690 lb. more water per mill. cu.ft. of gas are evaporated from oxide with an inlet temperature of 75°F. as compared with that at 60°F. For a 10 mill. cu.ft. per day set of purifiers working without radiation losses this would have to be replaced by 690 gal. of water per day.

In practice, radiation losses reduce the outlet gas temperature and the water removed by evaporation. A proportion of the condensate, however, escapes to the syphons instead of being returned to the oxide. From tables it can be determined that the maximum temperatures at which the gas can leave the purifiers saturated when the inlet temperatures are 60°F. and 75°F. without removing water vapour are 74°F. and 84½°F. respectively. It must again be emphasized that these figures assume that the inlet and outlet gases are saturated and that no heat is lost by radiation.

Inlet H_2S Concentration and Sulphur Loading

A daily record of the H_2S concentration in the gas entering the purifiers should be kept; once a week the percentage of sulphur in each box should be estimated, and the Works Engineer should be acquainted with the estimated average percentage sulphur loading of the purifier sets. It has been stated that such estimations are wide of the mark and misleading. However, experience with the Nechells towers indicates otherwise.

Costs of Oxide Purification

Costs for purifying gas in oxide purifiers are usually given in terms of pence per therm of gas purified. The chief value of this figure is that it represents the proportion of the manufacturing cost due to purification. It has very little relationship to the actual work performed by the purifiers.

The H_2S concentration in coal gas may vary from below 500 grains to above 1,000 grains per 100 cu.ft., and in carburetted water gas it may be from 150 to 240 grains per 100 cu.ft. It is therefore not fair to compare coal gas purification costs for different works or to compare coal gas with water gas purification costs in terms of pence per therm of gas into holder. It does not necessarily follow that the cheaper costs are for the lower concentrations; indeed gases having the higher H_2S concentrations should be cheaper to purify.

Since the purpose of oxide purification is to remove H_2S from the gas the costs should be based on a unit of weight of sulphur removed. This is not possible, however, since the actual weight of H_2S removed cannot be determined. Some passes to the syphons in the form of soluble salts. Townsend[10] gives figures indicating that only about 85% of the sulphur in the hydrogen sulphide removed from the gas appears as free sulphur in the spent oxide.

The saleable end-product is sulphur which can be considered as a by-product and costed accordingly, its value being the current price obtainable. The cost to produce one ton of sulphur as sold should be set against this current selling price and the result is a credit or debit per ton of sulphur sold. Similarly, all items of purification expenditure can be worked out per ton of sulphur sold over the period covered.

Typical figures for these items for coal gas purification in overhead purifiers with a double fouling system would be:—

	Cost per ton sulphur extracted (s.)	Cost per 100 tons sulphur extracted (£)
New oxide	90	450
Labour	65	325
Haulage	10	50
Plant repairs and maintenance	50	250
Total expenditure	215	1,075
Income from spent oxide	212	1,060
Deficit	3	15

The cost per ton of sulphur extracted for the new oxide used and the income from the spent oxide obtained are based on prices ruling between January 1, 1955, and March 31, 1955.

The figures for labour, haulage, plant repairs and maintenance are approximately correct for the overhead box purifiers of two Birmingham works over a period of 3½ years, from March 31, 1951, to September 30, 1954. It is emphasized that these items depend entirely on local circumstances.

Price obtained for Spent Oxide

There is a national scale of prices paid for spent oxide agreed between the National Sulphuric Acid Association and the Spent Oxide Negotiating Sub-Committee of the Gas Council. This scale is subject to review every three months. The price paid per unit of sulphur delivered free to the buyer's works varies according to the sulphur content on a wet basis and diminishes with the sulphur content.

The price paid for spent oxide increases in steps up to 48% and these steps involve greatly enhanced values for very small increases in the percentage sulphur content. The greatest step is from 46.0% to 46.1% which represents an increase of about £96 per 100 tons of sulphur extracted. A small admixture of spent oxide with a higher percentage sulphur would greatly enhance the value of a spent oxide containing 46.0% sulphur.

There is no increase in the price obtained for spent oxide per

100 tons of sulphur over 48%; in fact there is a very slight decrease in value between 48% and 52% for, while the price per unit remains the same, the quantity of spent oxide containing 100 tons of sulphur falls off as the percentage of sulphur increases, and the relationship is not linear. The approximate income from spent oxide of 212s. per ton of sulphur, mentioned at the beginning of this section, is equivalent to £1,060 per 100 tons of sulphur, which was the price obtained for spent oxide having between 48% and 52% sulphur from January 1, 1955, to March 31, 1955.

Spraying of spent oxide during crushing, preparatory for sale, is practised in order to mitigate the dust nuisance and reduce the possibility of the oxide firing during transit to the acid manufacturers. Provided the addition of water does not reduce the percentage sulphur in the spent oxide so that the value per unit is lowered—*i.e.*, below 48%, 46%, etc.—the price received for the spent oxide will remain the same. The increase in weight is balanced by the reduction in the percentage sulphur content. If, however, the addition of water reduces the price paid per unit, then the value of the spent oxide is reduced considerably. For instance, 60 gallons of water added to 100 tons of spent oxide containing 48.1% of sulphur would reduce its value by about £60.

Cost of New Oxide

The cost of new oxide per hundred tons of sulphur recovered varies according to (1) % sulphur in the spent oxide; (2) % moisture in the spent oxide; (3) % tar and water soluble salts in the spent oxide; (4) the weight of iron oxide and inerts in the new oxide.

(1) The decreased requirement of oxide is such that if oxide 'A' is fouled to give a spent oxide containing 7% water and 53% tar free sulphur, 97 tons of new oxide are used as against 157 tons when there is 43% tar free sulphur and 7% water in the spent oxide. At a price of 86s. 4d. per ton delivered for the new oxide 'A,' the effect of being able to work up the spent oxide from 43% to 53% is appreciable and in many cases justifies a further fouling when the extra price obtained for the spent oxide is added. Oxide 'B' costs 87s. per ton delivered on the works.

(2) Curves on graph 2 of this paper show the effect on the weight of new oxide, required for 100 tons of sulphur recovered, of different moisture contents in the resulting spent oxide. The small difference between 7% and 9% involves quantities between 6 tons at 55% sulphur and 8 tons at 42% sulphur. This is an approximate figure of 5s. per ton of sulphur removed. For a 1,000 mill. a year works extracting 400 tons of sulphur per year this is equivalent to £100 a year.

(3) The percentage tar, naphthalene and water soluble salts has the same effect as moisture on the cost of the new oxide, and it is necessary to know this figure before an accurate assessment can be made of the costs of materials. The spent oxide from a given weight containing no moisture and no tar, naphthalene and soluble salts at 50% spent, contains less sulphur than one containing say 16% moisture, tar, naphthalene, etc., and so is worth less.

(4) The bulk density of a new oxide is chiefly affected by the iron oxide content. Iron oxide has a specific gravity of about 5.0 as compared with water at 1 and the inert materials probably less than 1.0.

The bulk density of oxide which has 31% iron oxide is 42 lb. per cu.ft. against 52 lb. per cu.ft. for oxide 'B' which has 43% iron oxide. In comparing oxides 'A' and 'B', it is shown that about 13 tons less new oxide 'B' are required for each 100 tons of sulphur extracted, assuming the same water content in the spent oxide. The effect on the cost of new oxide is of the order of £55 per 100 tons of sulphur extracted. The cost of new oxide 'A' equals the cost of new oxide 'B' when the spent oxide 'A' is 50.7% sulphur and the spent oxide 'B' is 48.2% sulphur. The price obtained for the spent oxide in each case is the same, so the overall credit for materials is the same. This is important when comparing purification costs of two installations using different types of oxide.

Cost of Oxide Material

This figure is the surplus or deficit resulting from deducting the cost of the new oxide from the sale of the spent oxide obtained by fouling the new oxide.

Oxide 'B' can be worked up to 51% sulphur and 7% moisture in two foulings, and it then gives a surplus of £597 per 100 tons of sulphur removed or 119s. 6d. per ton of sulphur removed. Experience has shown that labour, haulage, plant repairs and maintenance can total 125s. per ton of sulphur removed. Under these circumstances the cost of purification is 5s. 6d. per ton of sulphur extracted.

A bog ore has the following analysis on a wet basis—52% H_2O, 26% Fe_2O_3, 22% inert materials. It costs 89s. 3d. per ton delivered at the works. It is interesting to compare the economics of its use as a purification material with the prepared oxides 'A' and 'B.'

Use of bog ore in preference to oxide 'B' would increase the purification costs of a 1,000 mill. a year works by about £800 a year, assuming an average H_2S content in the gas of 630 grains per 100 cu.ft. and that both oxides could be fouled to 51% sulphur in two foulings. The bog ore has to be fouled to 44% sulphur before the cost of the new oxide meets the present price obtainable for the spent oxide.

Assuming that the same labour, haulage, plant repairs and maintenance costs given at the beginning of this section apply (*i.e.*, 125s. per ton of sulphur extracted), and that this bog ore was used and fouled to 51% sulphur, the surplus for materials would be 87s. 6d. per ton of sulphur extracted. The overall cost would be 37s. 6d. per ton of sulphur extracted, as compared with 3s. in the example cited at the beginning of this section when using a prepared oxide.

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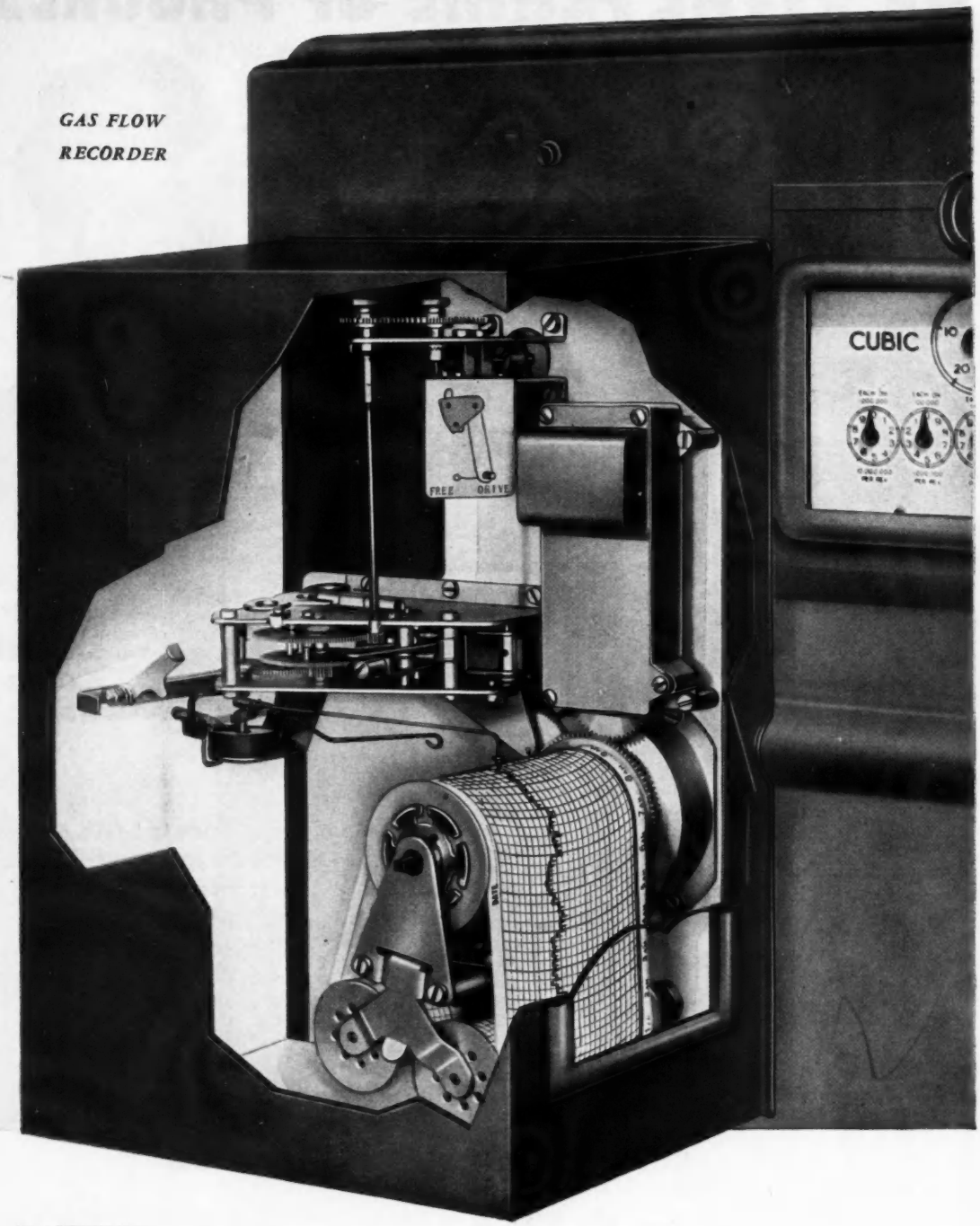
BUNSEN BURNER CENTENARY

One hundred years ago Professor R. W. Bunsen, of Heidelberg, invented the gas burner which bears his name, and is now one of the most versatile heating appliances of the scientific laboratory. The Science Museum is celebrating this centenary by focusing attention on its collection of bunsen burners and of other burners which preceded or followed bunsens in laboratory use. Bunsen's claim to fame extends far beyond the laboratory, and in domestic as well as industrial appliances which use gas for heating, the bunsen type of burner has played a very important part. The collection is exhibited in Gallery 66 on the top floor of the Museum, which is open free on weekdays (including Bank Holidays) from 10 a.m. to 6 p.m., and Sundays from 2.30 to 6 p.m.

NATIONAL INDUSTRIAL SAFETY WEEK

National Industrial Safety Week, under the auspices of the Royal Society for the Prevention of Accidents, will be held from October 24 to 29. The object of the campaign is to encourage all workers—particularly young workers—to 'Start a safety habit today,' and to remember that 'Safety habits last a lifetime.' During the launching week of the campaign it is hoped to introduce these two slogans into every factory, large or small, throughout the United Kingdom. Thereafter, managements will be asked to keep these and similar slogans constantly before their workers, and to foster an enthusiasm for safe working, a result which can be achieved if managements take the initiative and make it clear to all their employees that they fully realize the importance of accident prevention. Throughout the United Kingdom there are some 50 local industrial accident prevention groups who will be organizing special functions in connection with the campaign, in which many of them will be supported by the local civic heads and Chamber of Commerce. Individual works safety officers will carry the campaign into their own factories.

GAS FLOW
RECORDER



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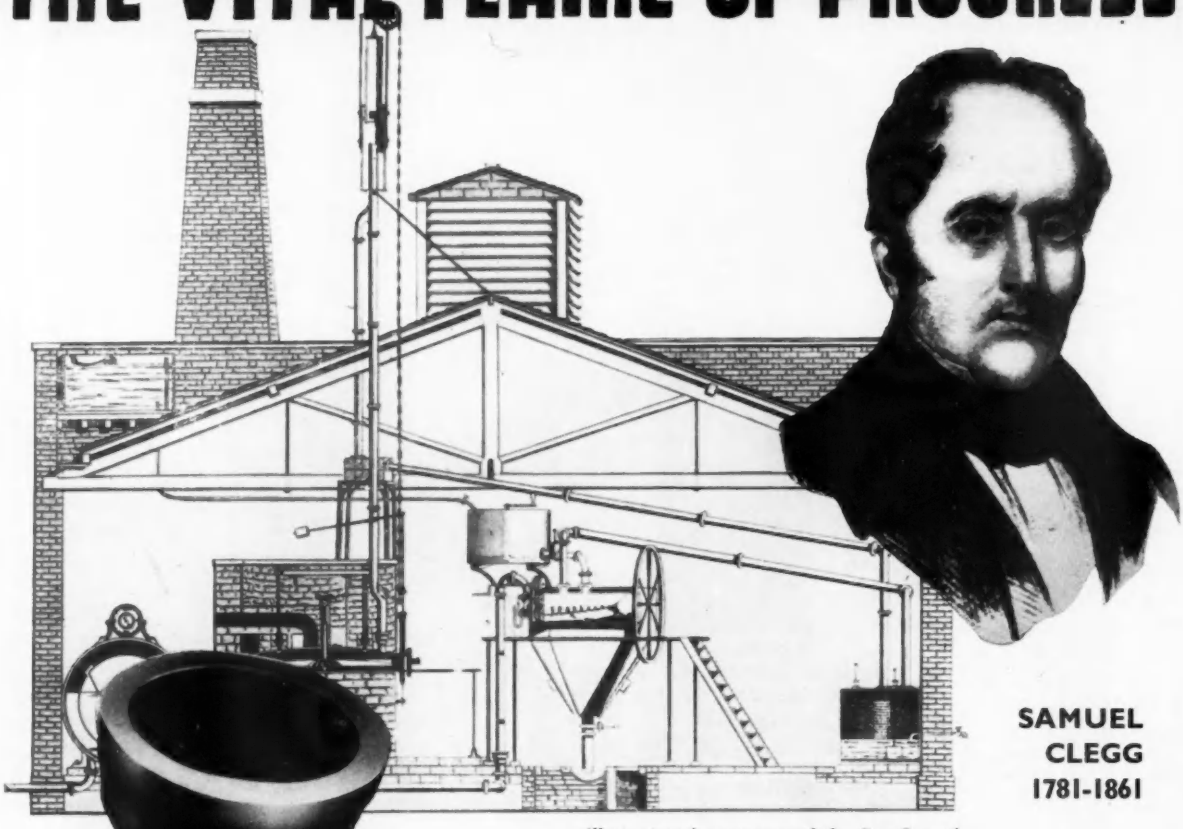

SAMUEL CLEGG 1781-1861

Illustrations by courtesy of the Gas Council.

A Mancunian, born in 1781, played an important part in the engineering of early gas plants and particularly in the purification of gas before distribution.

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New Ideas in Manometer Design

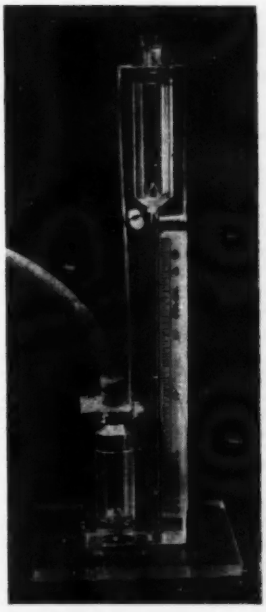
By LESLIE T. MINCHIN, B.Sc., M.Inst.Gas E., F.Inst.F.

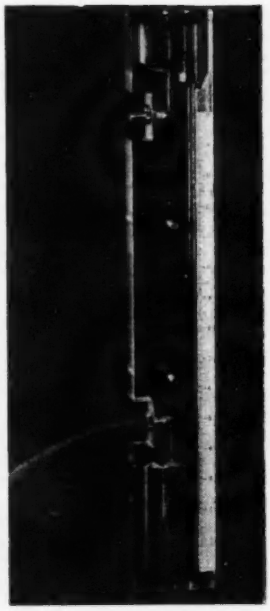
THE stages in the history of mankind are often named after the constructional materials available in each period. After the reign of iron, its close associate, steel, began to fashion human destiny. In our own century, we have seen changes produced by stainless steel, chromium plate, and, most of all, by plastics. It was only 46 years ago that Dr. Baekland invented this latter group of substances, but their effect on our lives has been enormous.

As yet, however, the full impact of this technical revolution has not been felt. Certainly many of the articles used in the gas industry will in future be made of plastic rather than in their traditional materials. One can still walk round a gasworks—or any other establishment—and see glass being used in places where it is liable to get broken, and where one of the transparent plastics would be much more suitable.

The liquid column pressure gauge which is such a useful handmaiden to the industry seems to provide an excellent opportunity for the use of this material. The initiative in this matter came from Holland, where the Mulder manometer (named after a gas engineer at The Hague) originated. This gauge was of the single-column type, it had non-spillable chambers at each end, and was designed so that excess pressure would not lead to loss of the gauge liquid. A special light paraffin of sp. gr. 0.8 was used, and quite a number of these gauges have given good service both here and on the Continent.

The Mulder gauge was a most valuable pioneer, but the method of construction had several minor defects. In the first case the scale was not removable, except by breaking a cemented joint; consequently it could not easily be kept clean. In the second case, the mode of manufacture involved the cementing of one layer of 'Perspex' on another, and this can easily give rise to 'crazing' at the interface. The British version of this instrument, as it is now being produced by Combustion Instruments, is shown in Fig. 1. Unlike the Mulder gauge, this is made from a solid block of plastic by a drilling process which must be carried out with the greatest care. The scale—which is corrected for the specific gravity of the oil and for the depression of the level in the reservoir—is inserted into a slot cut in the side of the block, and is held there by a leaf-spring. Not only does this make it easy to remove the scale for cleaning, but, also, the new position—in the same plane as the gauge tube—prevents parallax errors.





Figs 1 and 2. Examples of pressure gauges made from plastic.

This gauge is widely used for measuring draught in boiler flues, for it is much more sensitive than the old-fashioned U-tube. Pressure (or suction) can quite easily be read to one fortieth of an inch—*i.e.*, one half of the smallest division on the scale. The gauge fits into a limp plastic case in which is a pocket for a spare capsule of the gauge liquid, and the whole measures 10 in. by 3¼ in. by 1 in. Being non-spillable, the apparatus can be carried in the brief-case for days at a time, and is ready for use at a moment's notice. (The present illustration, however, shows it mounted on a plastic stand for bench work.)

The 4½ in. gauge is suitable for checking the setting of gas appliances, but for other purposes a larger gauge is often needed. Fig. 2 shows the same principle being used in a gauge for use up to 15 in. W.G. In this case an aqueous solution is employed, for it is desirable to get as high a range as possible. Moreover, this model is useful for measuring the pressure of L.P. gas, and in that case oil is unsuitable in any event.

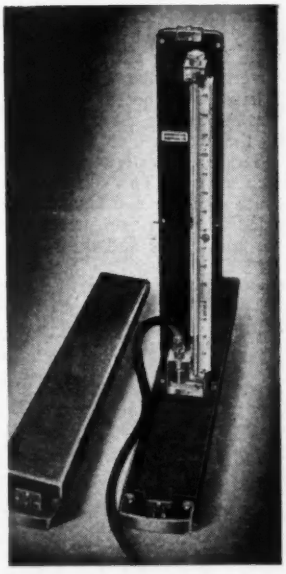


Fig 3. C.1 (Mark 2) pressure gauge.

The method of construction so far described cannot be used for larger sizes than this, however. If one wishes for a larger gauge, it becomes no longer practicable to drill the hole through a solid block, and the apparatus must be built up using extruded tubing. Such a gauge is shown in Fig. 3 and this is intended primarily for distribution departments. Mercury is the liquid, and in the standard pattern a maximum of 15 in. pressure can be measured. The non-spill character of this range of manometers is here achieved in a rather different manner, for with mercury a semi-permeable membrane can be employed which will transmit air pressure but will not allow mercury to pass. This gauge has a steel case, which has a recess in the middle enabling it to be used as a stand. The whole, when closed (left-hand side) is eminently portable, and measures only 19½ in. by 3 in. by 1½ in.

Panel-mounting

The gauges so far discussed have been portable, but another application of the same basic design is to panel-mounting. In this case, of course, the push-on connections are replaced by copper tubes with compression-joint unions and in some cases connection can be made by tubes projecting backwards. An early example of the use of this type of gauge for panel-mounting is to be seen in the compressor house at the East Greenwich works of the South Eastern Gas Board.

All the gauges illustrated here may be obtained from Combusion Instruments, 61, Belsize Lane, London, N.W.3.

Portable Cover Furnace Installation*

DEVELOPMENT COMMITTEE'S REPORT

A REPORT of the Industrial Gas Development Committee deals with an installation of a portable cover furnace for annealing malleable cast iron, supplied by the Dowson & Mason Gas Plant Co., Ltd., at Ransomes, Sims & Jefferies, Ltd., Ipswich. The furnace consists of two sections, the cover and the base. The cover is constructed of steel plates and structural steel members welded to form a hood, provided with a lifting lug and lined with lightweight insulating refractory 9 in. thick. The inner face of the brickwork is covered with a refractory cement. The hood has internal dimensions of 9 ft. wide, 14 ft. 6 in. long by 5 ft. 9 in., while its external dimensions are 14 ft. wide, 19 ft. long by 8 ft. high. The weight of the hood is 11 tons.

The base of the working hearth is 12 ft. 9 in. long by 7 ft. 6 in. wide. This consists of a strong structural steel casing lined with firebrick and lightweight insulating refractory and embraces the flue-ways, burner and metallic recuperative systems.

Heat and Air Supply

Heating of the furnace is accomplished by the natural tendency of the hot gases of combustion to rise to the top of the arch and then slowly fall as they give up their heat to the material and the walls being heated. The gases are finally exhausted at hearth level at the two ends, and pass away through flues in the base. The bottom is, therefore, kept warm by the hot gases on their way out of the furnace.

The air is preheated by the waste gases in a novel form of recuperator. This consists of a number of thimble tubes—*i.e.*, tubes with one end blanked, of calorized steel, into which are inserted smaller diameter tubes, so that the air is blown through the inner tubes and then passes between the inner and outer

Fig. 1. The base of the furnace is shown loaded with cast iron pots. The burner controls and burner ports can be clearly seen along the sides, while the flue downtakes are seen on the ends of the furnace base.

tubes to openings in the refractory immediately below the gas jets. Each burner has its own recuperator element, and the control of the air cock is on the cold side of the recuperator. Once the air has entered the element it does not return to the outside of the furnace when hot. This form of recuperation not only reduces the gas consumption but, together with the method of burning, produces a soft lambent flame which is so good in a furnace for temperature uniformity.

A Peebles gas governor controls the inlet working pressure to 2 in. W.G. The burners are a series of open ports built vertically from the recuperator tubes. Gas is injected through controlled openings in the sides of the ports, causing luminous flames which create a curtain inside each longitudinal wall of the cover. The waste gas is finally exhausted from the furnace under the centre of the hearth and passes away through an underground flue to a chimney which has a total height of 33 ft.

The electrically-driven air blowing fan provides air at a pressure of 6 in. W.G. and this passes through the air control valves into a box at one end of the base, from which it is distributed by built in air ports, to the air control cocks on the inlet of the recuperator tubes. The temperature control consists of a

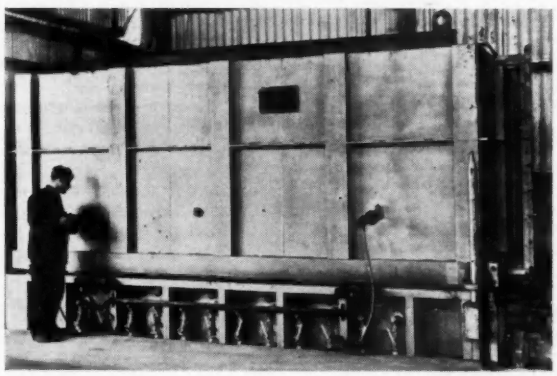


Fig. 2. The hood is shown in position on the base with a thermocouple being inserted.

Kelvin & Hughes single-point electronic indicator control pyrometer with red and green signal lights. The temperature record is a four-point type. Means are provided for protecting the thermo-couples when they are taken out of the hood prior to its removal from the base.

Annealing Process

The process involves the annealing of white cast iron of a particular composition in a fine ore in cast iron pots to produce 'whiteheart' malleable cast iron. The annealing process serves to reduce the carbon content in the iron producing a tensile strength of 25 tons per sq. in. and elongation of 4% to 10%. The charge consists of 18 tons and is made up of 54 pots having internal dimensions of 1 ft. 7 in. dia. by 1 ft. 4 in. high, six pots being arranged in the length, three in the width, and three in the height. The load comprises five tons of castings, six tons of pots and seven tons of ore raised from cold to 980°C. in 30 hours and held at that temperature for 80 hours. The charge is then cooled under the hood, with all gas turned off, to a temperature of 600°C. in 48 hours, the complete cycle taking about 160 hours.

Ransomes, Sims & Jefferies are highly delighted with the results obtained with this furnace. They have since installed another furnace, for the same purpose, but of the bogie hearth type. The reason for the change has been dictated by lack of suitable lifting capacity necessary for the second furnace, which is double the capacity of that described in this report. It is hoped to make this the subject of a further report.

To mark the 21st anniversary of its foundation, the Council of the Institute of Vitreous Enamellers has announced that an International Congress on Vitreous Enamelling will be held in this country commencing on October 9. The first British International Congress on Enamelling was held under the auspices of the Institute in 1948, when many wartime shortages and restrictions were still operating and the industry had not re-attained its peacetime status. Since that time, there has been considerable progress, and a comprehensive programme of over 16 technical papers is planned.

* Reproduced from report No. 600/55 of the Industrial Gas Development Committee of the Gas Council (Information supplied by the Eastern Gas Board).

Consumers' Councils Review Coal and Coke Problems

THE eighth annual reports of the Industrial Coal Consumers' Council and the Domestic Coal Consumers' Council were published as one document on July 28. Although they were intended to cover the deliberations of the Councils up to June 30 they included references to the 18% increase in the price of coal as from July 18. The Industrial Council 'greatly deplored the compulsion which the National Coal Board was under, as a commercial concern, to increase prices so substantially to meet the various rises in costs which it had to bear.' The Domestic Council was 'seriously disturbed' at the prospect of dearer coal because of its repercussions on old age pensioners and others living on low incomes.

Cost of Imports

The two Councils express opposite views on subsidizing imports. The Industrial Council reaffirms support of the method of increasing prices by a uniform percentage on all grades of coal and is still firmly of the opinion that the present method of passing on to coal consumers generally the additional cost of imported over indigenous coal is right; 'we think it would be wrong to attempt to disguise the effect of the shortage of our own coal by subsidizing imports.'

The Domestic Council says: 'We cannot stop the proposed increases. In the long run it is the consumer who has to pay for higher costs of production anyway. We think, however, that the Government should consider whether the National Coal Board could be relieved of the responsibility for the interest on the compensation to former mine owners and the expense of importing coal.'

The Industrial Council notes with dismay the disastrous fall in deep-mined production and the grievious effect of the succession of strikes, nearly all of which were unofficial. It says there must be a new determination or will on the part of all in the industry to co-operate to produce the amount of fuel adequate for the nation's needs. Improved standards of administration and management are also needed in the coal industry, with its manifold responsibilities, and the Council is glad, therefore, that with the object of improving and strengthening the organization of the National Coal Board, the Government and the Board have acted promptly to implement the recommendations of the Fleck Committee. It realizes that the new Board has a long and difficult task before it.

Depleted Stocks

Home consumption of coal in 1954 was 5 mill. tons more than in 1953, and the Industrial Council says that had it not been for the increase in imports of 2.4 mill. tons the total stocks would have fallen to a level which might well have led to serious dislocation of industry. Stocks at the end of the year were about 2 mill. tons less than at the end of 1953, leaving only a slender margin of safety. Tribute is paid to the marketing department of the National Coal Board, the transport industry, and distributors for their successful efforts to maintain supplies during the winter difficulties despite disruption due to strikes, and emphasis is laid on the need for a great effort to build up the distributed stocks of coal to a safe level by the end of November, in the absence of which there would be a grave danger of hindering industrial activity and creating hardship.

The report discusses the policy of importing and exporting coal and the Council asks that while there is need to import coal the Government should allow the National Coal Board maximum freedom in timing purchases. 'International trading commitments must be honoured, but we think there is no longer any validity in the argument that it is desirable that foreign markets for coal should be kept alive.' Qualifying this statement at a Press conference in London on July 28, Mr. T. Coxon (Imperial Chemical Industries, Ltd.), a member of the Council, in the absence abroad of Sir Ernest Smith, the Chairman, said there was no intention to interrupt essential exports to those countries which depended on British coal as much as Britain depended in exchange on their supplies of foodstuffs.

3,400 Men Leave the Industry

Mr. Coxon drew attention to the fact that total coal output had decreased by 2,564,700 tons, which was all the more regrettable as it had occurred during a period of continued expansion of industrial activity. Production of deep-mined coal had suffered grievously by a succession of strikes, nearly all unofficial and against the advice of responsible labour leaders. In 1954 strikes resulted in an estimated loss of saleable coal to the extent of 494,948 tons; in 1955 up to the end of May the loss due to strikes was 1,884,200 tons. It was hoped, said Mr. Coxon, that the implementation of the recommendations in the Fleck report for better management and administration would lead to an improvement in labour relations; 'we are all entitled to expect that'.

During the past 12 months the industry had lost about 3,400 men, and the Industrial Council thought that as these men had been lost, the use of overseas labour, including men from the Commonwealth, should be re-examined. The Council realized that there were difficulties, in some cases difficulties of language, and in others of training, but unless something was done the situation would get worse.

Representations had been received from the Northern Gas Consultative Council suggesting that the Coal Board had acted in a discriminatory manner in May, 1954, in applying increases to the price of coal, particularly in respect of the kind of coal used by the Northern Gas Board. The Consultative Council was disappointed that the Coal Board, having established in 1951 what was regarded as a rational price structure, should have increased prices on a quality basis (instead of by means of a flat rate) and that Durham gas coal appeared to have been made to carry a further coalfield adjustment. The area increase was about 2s. a ton more than the national average for the gas industry, and this was detrimental to the prosperity of the area. The Consultative Council sought consideration of (a) the separation of gas coal from its close relationship to coking coal in the Coal Board's classification; and (b) in the event of any further coal price increase on a similar basis to the increase in recent years, the possibility of applying such increase to the gas industry as a flat rate throughout the country as a whole.

While sharing the concern at the increase in price, the Industrial Council consistently opposed the principle of a flat rate increase for all coal irrespective of quality, because this would distort the relationship between the prices of the better and poorer qualities. Such increases were unfair to consumers who bought low grade coal which was relatively more costly in transport and use. When the price structure was under revision the Council was advised by the Coal Board that the question of evaluating gas and coking coals separately was considered, but the Board was unable to reconcile the divergent interests revealed in consultations with consumers.

Price Structures

If at some future date separate price structures were evolved which appeared to be acceptable to the gas and coking industries, the Industrial Council wanted to be convinced that they would not conflict with the assurances given by the Coal Board that the same price at pit for any particular coal would apply to all industrial consumers for whatever purpose it might be used.

The Council asks whether miners' holidays cannot be further staggered to ensure the maximum possible continuity of supplies, and it supports the experimental summer stocking scheme for hard coke introduced this year by the British Coking Industry Association. While commending the work of the National Industrial Fuel Efficiency Service it regrets that greater encouragement has not been given by the Government to means for stimulating fuel saving. The Council also welcomes the trend towards the reduction of atmospheric pollution.

Air Pollution and Fuel Policy

Pointing out that to meet the increased demand for coke the amount of coal carbonized at gasworks would need to be considerably increased, the report goes

on: 'In recent years the gas industry has not been supplied with the coal it needed to meet its obligations, nor was all the coal it received of entirely suitable quality; rather has the gas industry been compelled to supply a substantial proportion of its gas as water gas manufactured from oil and coke, which practice contributed towards the excessive reduction in stocks of domestic coke last winter.' Last year's report referred to the task of making available adequate supplies of carbonization coal to the carbonizing industries despite a continuing overall shortage of coal, and the present report lays added stress on this subject now that a realistic effort is to be made to rid the atmosphere of excessive smoke and fog. 'It is not the case that there is any shortage of carbonization coal as such, as some coal suitable, or capable of being suitable, for carbonization is burned in the raw state in domestic grates, under locomotive boilers, and by general industry.'

The Domestic Coal Consumers' Council deals with coke as well as coal problems, indeed the greater part of its report is devoted to coke. Winter delays in coke deliveries were comparable with those in regard to coal. There was scarcity partly because the gas industry could not get all the coal it needed to produce coke, and partly because more consumers turn to coke when house coal is short. The remedies are the same—more ample supplies and maximum delivery in the summer. The Council wants to see the Beaver Report implemented in the shortest practicable time but realizes that many difficulties must be surmounted before the nation can enjoy the new amenity of a cleaner atmosphere. It hopes every effort will be made to supply the smokeless fuel industries with all the coal they need and that the gas industry will be enabled to produce steadily increasing quantities of suitable coke of consistent quality.

With the prospect of changing fuel habits in mind, the Council re-states the objectives to which all concerned in producing and supplying domestic fuel should work; in this connection the Beaver Committee's recommendation that the British Standards Institution should prepare specifications of quality and methods of testing coke is welcomed.

The Council thinks it is very desirable that the possibility of encouraging all persons who are able to stock gas coke in the summer by a differential price scheme should be reconsidered. It is aware that circumstances in the gas industry are not the same as in the coal and hard coke industries, but circumstances are changing, and 'it is of the utmost importance that supplies of gas coke as of coal and hard coke should be distributed to the maximum extent in the summer.'

The Industrial Coal Consumers' Council, whose Chairman, as already mentioned, is Sir Ernest Smith, includes among its members Mr. C. Johnson, Coal Officer to the Gas Council, and Mr. Tom Williamson, Vice-Chairman of the National Joint Industrial Council for the Gas Industry. The Domestic Coal Consumers' Council, presided over by Alderman Mrs. F. H. Cantwell, of the Islington Borough Council, includes among its members Mr. J. O. Cooke, Coke Officer to the Gas Council, Sir John Charrington, Vice-President of the British Coal Utilization Research Association, and Dr. D. T. A. Townend, Director General of B.C.U.R.A.

FRACTURE OF GAS PIPES

The question of the fracture of gas pipes in cold weather was mentioned again at a meeting of the South Eastern Gas Consultative Council, at which Mr. A. B. Constable presided, at Caxton Hall, Westminster, on July 5. At a previous meeting the Chairman of the West Surrey Divisional Committee had sought information as to the estimated average life of underground service pipes, and as to whether such pipes were periodically inspected or tested; he had also asked whether there was considered to be a safety margin of depth for laying such pipes.

An appropriate enquiry had been addressed to the Gas Board, whose reply stated that in the past the life of wrought iron or steel service pipes, which were generally laid without wrapping, varied, according to the type of soil, from 15 to 50 years. The present practice was to use steel service pipes protected externally with bitumen and coated internally with red lead paint to inhibit corrosion. Such pipes should have a normal life of 40 to 75 years. Cast iron mains were more resistant to corrosion than steel service pipes and might last for 70 to 100 years or more.

There was no regular programme for inspecting mains or service pipes, but when roads were opened, opportunity was taken to make an inspection and renew the pipes if this was necessary. Where a service pipe was to be relaid on account of age, it was the general practice to examine one or two services on either side to find out their condition and, if necessary, to relay them. The usual depth at which cast iron mains were laid in the streets was approximately 2 ft. 6 in., and as service pipes normally had a fall from the house to the main their average depth would be approximately 1 ft. 6 in. This was considered sufficient to protect them from external damage.

A question had been raised by the East Surrey Committee as to the availability of light metal linings for gas cookers, which would normally be destructible and would be replaced by new ones as an alternative to cleaning. It was understood that American type cookers were constructed on that basis.

An official reply from the Board said enquiries had been made, and it appeared that no cookers made in this country had destructible metal linings. Several manufacturers had in the past made cookers with linings which could be taken out and cleaned, but apparently they were not generally popular, and it was believed that only one cooker made today had that feature.

Joint reading of gas and electricity meters was again mentioned, and although it was said no further information was available it was added that experts were still studying the question. Mr. Eastwick told the Council that a firm of industrial advisers had been called in nationally to look into the position, and they were now in a position to carry out investigations in four separate areas—Bristol, Sheffield, the Loughton, Woodford, and Chingford area of Essex, and a rural district in Suffolk. The investigation was complicated by the fact that the two industries had different accountancy methods, different indices, and different terms and conditions of employment.

A report from the Kent Suburban Committee stated that there had been complaints of delay due to shortage of fitters, partciularly in the Beckenham area. The Council had asked the Board whether, as a result of the training schemes which it was understood were now in operation, there was any prospect of increasing the number of fitters available, thereby reducing the prospect of complaints from consumers.

The Board's reply was that its training schemes would increase the number of skilled men available for fitting work in time, but the effect would not be felt for a number of years. To overcome the present shortage in the Kent Suburban Division the Board was using contractors for servicing work and was seeking to increase the output of fitting work by introducing piece work wherever possible.

The Consultative Council had forwarded copies of correspondence with an architect regarding the Board's charges for providing a supply of gas to flats at Blackheath, S.E.3. The architect had questioned the Board's charges amounting to £10 5s. per flat on the ground that the charge made by the North Thames Gas Board for an identical block of flats at Ham, Surrey, was £4 7s. per flat.

The Council had asked for some general information on this subject. The Board replied that the cost of providing a gas supply for new buildings depended on the nature of the development and the position of the site. Where the development was of an intensive nature and adjacent to existing mains, as in many local authority housing schemes, the Board asked for a minimum contribution of £4 7s. from the developer. In other cases the Board asked the developer to make a contribution to the cost of laying the mains required. The cost of providing a complete gas installation for the 61 flats at Blackheath was £41 per flat, and the charge of £10 5s. was, therefore, not considered unreasonable.

PRIZEWINNING WINDOW

During a Home Laundry Campaign of the East Midlands Gas Board a competition was organized for the best dressed window. Our photograph shows the prizewinning window in Market Street, Leicester, where the Parkinson 'Live Water' washing machine was featured, the tie-up being the water mill. The appropriate slogans were 'Live Water turns the mill wheel' and 'Live Water does the washing.'

RADIATION COOKERY BOOK

In 1927, Radiation Ltd., makers of the well-known New World series of gas cookers, published their own cookery book. Although produced primarily for use with New World cookers, the book is of value to all who cook by gas, and has become a standard work of reference to thousands of housewives all over the country. In fact, since the original publication, the book has gone into 46 editions and well over two million copies have been sold. Now, with food rationing a thing of the past, and every facility available for the housewife to produce attractive and more ambitious meals, it has been decided to issue a de-luxe Radiation cookery book.

The book is divided into twenty-four sections for easy reference and includes, in addition to such subjects as carving, wines, invalid cookery and fruit bottling, details of the latest New World cookers and those earlier models which are still in use, with hints on the care, use and cleaning of the cooker, as well as advice on kitchen management, and a wealth of information invaluable to the woman who plans and cooks the meals for her family. The recipe sections are set out to conform to a definite pattern and are arranged in order of menu (from hors d'œuvre, soups and fish through to savouries) with sections on special dishes and operations, with appropriate cross-references. Each section commences with general information as appropriate, concerning seasonal availability, food value, guidance in purchasing, preparation and the various methods of cooking. Recipes for the last-named are sectionalised in alphabetical order. Of particular interest is the section on whole dinner menus as the cooking of a complete meal in the oven not only saves gas but reduces the attention required while the meal is cooking. Use is made of the temperature gradient in the oven in cooking at the same Regulo setting several dishes requiring different cooking temperatures. Printed on very high quality paper, and profusely illustrated both in colour and black and white, the de-luxe edition of the Radiation Cookery Book is priced at 9s. 6d. per copy, available from gas showrooms or direct, post free, from Radiation Ltd., Radiation House, 7, Stratford Place, London, W.1. The standard Cookery Book continues to be available from the same sources, price 4s. per copy.

Gas to be Piped Across the Border

Work has begun on the laying of a 4 in. main from the Northern Gas Board's modernized plant at Spittal to the Berwickshire town of Eyemouth and to nearby Ayton, a distance of 15 miles. The intention is to feed gas across the Border from the English plant to the Scottish town, making this the first example of integrated operation involving plants in England and Scotland. It is hoped to have the supply available for Eyemouth by next spring.

This development is in line with similar moves throughout Scotland whereby less efficient smaller local units have been eliminated and their supply provided from enlarged or new units in adjoining areas. The system has already been worked to advantage on the Clyde with mains on the north and south side, and in the Edinburgh area where mains now feed several of the towns lying to the south of the city. In Lanarkshire too, the system has been used to advantage and is being still further developed by the incorporation of mains to link up with the new steel project which is in process of development at Motherwell and which will mean a considerable addition of coke oven output when the scheme is finally in operation.

The result of all these developments has been a definite easing of the supply position and an improvement of service in many areas where the gas supply was not completely satisfactory because of age of the plant or rapid expansion of housing.

£25 FOR BEST SUGGESTION

Mr. N. P. Parkinson, Housing Officer, Leicester Undertaking, East Midlands Gas Board, is the first employee to receive the Board's newly instituted annual award for the best suggestion submitted under its Suggestion Scheme. Photo shows: The Chairman of the Board, Mr. Sydney Smith, presenting the award to Mr. Parkinson; looking on are, left to right: Mr. H. B. Taylor, General Manager, Leicester and Northants Division; Mr. E. H. Harman, Deputy Chairman; Mr. J. Corrigan, Sales and Service Manager, Leicester and Northants Division; and Mr. A. T. Raby, Area Education and Welfare Officer (Secretary to the Suggestion Scheme Committee).

East Midlands Adopts 'Cushion' Gas Tariff

The East Midlands Gas Consultative Council at Nottingham on August 5 accepted a new two-block tariff, designed to cushion the effect, for the average gas consumer, of the recent 18% increases in coal prices. Putting the proposal before the Council, Mr. Sydney Smith, Chairman of the East Midlands Gas Board, said that due largely to increases in the price of coal and coke oven gas, the Board's net annual costs had risen by £1,750,000. To meet these increases it was necessary to raise the price of gas by an average of 1½d. per therm, the lowest so far made by any Gas Board to cover cost increases detailed in a report (coal, coke oven gas, freight, wages, salaries, interest, and depreciation charges). The average price of all gas sold in the area would now be, without exception, the lowest of any area gas board in the country.

'Briefly', said Mr. Smith, 'our proposal is for a two-block domestic tariff (with a relatively high priced first block, as in the case of electricity tariffs) designed to ensure that each consumer more nearly bears his fair share of the costs of providing a gas service; to provide for lower running costs; to encourage small consumers to raise their consumption to a level where it becomes economic for us to supply them; and to allow effective competition with other fuels for the type of business which, in the national interest, gas should supply.

'The new structure will benefit the average domestic consumer but, quite obviously, its effect will be to increase the cost to small consumers, particularly those taking less than 10 therms per quarter; and in this connection, I should like to take the opportunity of correcting a widely held misconception concerning small users. The very small consumer is by no means always the old age pensioner. In fact, the great majority of pensioners fall into the average consumer group and many could thus benefit from the new tariff. Too many small consumers use gas as a convenient supplementary fuel to the main heating and cooking appliances.

'It is therefore proposed to introduce a domestic tariff with a small first block at a price of 26d. to 28d. per therm according to the price zone, followed by a block of 13.5d. to 16d. per therm (again according to the price zone) for the second block. The ratio between these two sets of prices, roughly 2-1, is very much smaller than in the case of the electricity supply industry where the ratio is approximately 5-1.'

Mr. Smith said their choice of method would undoubtedly benefit the great majority of households within the area and at the same time ensure a more equitable distribution of the 'fixed' costs of supply among all consumers.

It was earlier pointed out that the new tariff will mean that the average consumer with a gas cooker will have to find a further 3½d. a week compared with 4½d. if the old three-block tariff were adhered to.

Referring to the special position of Scunthorpe, Mr. Smith said that following representations on July 29 they had reconsidered their proposal to bring Scunthorpe into Zone 4, and it had been decided there were good grounds for allowing the town to remain for the present in Zone 1. The completion date of the North Lincs grid scheme would be temporarily delayed through the deferment of certain capital projects and, for this reason, the Board accepted the view of the Tariffs Committee that it would not be right to anticipate the transfer of Scunthorpe to a higher priced zone. The annual cost of this amendment would amount to £20,000, which the Board would seek to absorb. It was not, however, proposed to withhold from Grimsby and the rest of Zone 4 the full estimated annual economies of £70,000 which were expected to accrue eventually from the grid scheme, and for which due allowance had been made in the new price of gas.

Mr. F. A. Heron, Vice-chairman of the Leicester and Northants Divisional Committee, suggested that the Board was over-reaching itself and discriminating against the small consumer by an increase of 40%. He would like to see a block not so high for the small consumer and suggested the Board should take another look at the two-block tariff between now and its introduction in October to see what could be done.

Mr. H. R. Hart, Commercial Manager of the Board, pointed out that the increase in the Notts and Derby Area would be only ¼d. a day to the small consumer.

Mr. Hart said the small consumer was not the old age pensioner and many pensioners came under 'medium' consumers. The two-block tariff would benefit the pensioner more than would a three-block tariff.

Alderman M. Creighton (Sheffield and Rotherham) asked if it were not possible to let the old age pensioner stay where he was on production of a pension book. He could not see any administrative difficulty in the way of this.

After hearing other pleas for the pensioner, Mr. Smith said they would accept in principle that old age pensioners, on production of their pension books, should have the option of remaining on the old three-block tariff.

Gas prices to industrial consumers would increase from 16.5% on 1,000 therms a quarter, to 7.3% on over 2 mill.

DUTCH SCHOOLGIRLS IN LIVERPOOL

Officers of the Liverpool Group of the North Western Gas Board on July 25 were hosts to a party of Dutch schoolgirls who visited Radiant House with a similar number of English schoolgirls. The visit was arranged at the request of the Liverpool-Amsterdam Schools Exchange Committee. After inspecting the latest gas appliances in the showrooms the girls were taken to the theatre for a demonstration of cold cookery and a short film show.

Mr. Frank Fisher (Group Sales and Service Officer) welcomes to Radiant House Mrs. Jacobson who escorted the Dutch girls on their visit to Liverpool.

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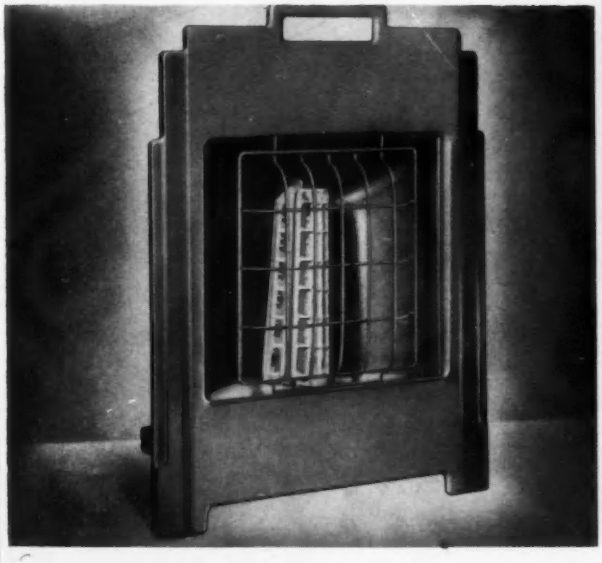

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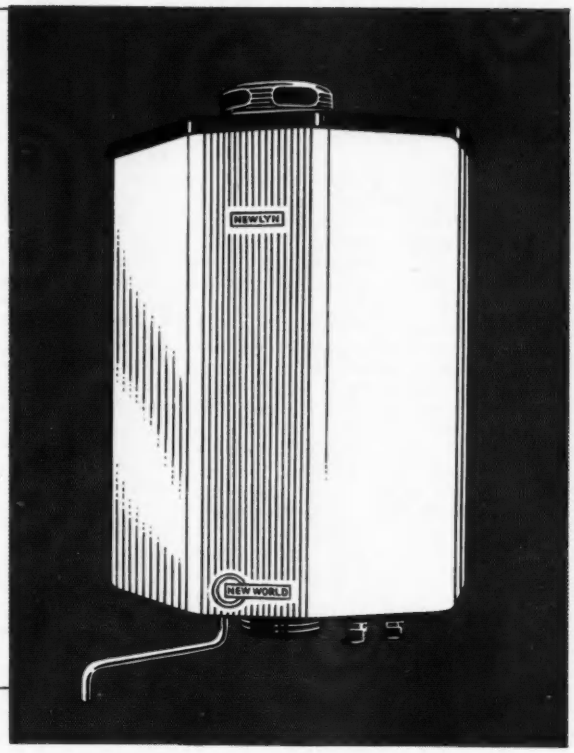

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NALGO Attäins its Golden Jubilee

The National and Local Government Officers Association—NALGO for short—which was formed as the National Association of Local Government Officers in 1905 celebrated its Golden Jubilee on July 29. In the 50 years since it was founded it has increased its assets from nil to £435,000, increased its full-time staff from none to 280 (including the staffs of its ancillaries), of whom 70 are employed in district offices throughout the country, the number of its branches from eight to 1,350, and the number of its honorary branch officers from 30 to about 10,000.

It has engaged in many activities to increase public interest in the working of local government and to make it a constructive partnership between the councillor, the official, and the citizen, and it has expanded its interests from local government to seven other public services—gas, electricity, water, new towns, national health, docks and inland waterways, and road passenger transport. It has a strong gas industry section with its own Organizing Officer, Mr. G. H. Newman. It shares with the British Gas Staff Association the representation of employees on the National Joint Council for Gas Staffs, and with the Gas Officers Guild the representation of officers on the Senior Gas Officers Joint Council.

To mark its Jubilee it received messages of congratulation and good wishes from the Minister of Fuel and Power, the Chairman of the Gas Council, and the two other staff organizations.

MR. GEOFFREY LLOYD, Minister of Fuel and Power, wrote: 'My hearty congratulations to NALGO on the occasion of its 50th birthday. Over the years the Association has played its part in the development of trade unionism in this country, and the high standards of efficiency and integrity which distinguish the British local government service owe much to its efforts. The Association has a record of which it may be justly proud. May it continue to flourish.'

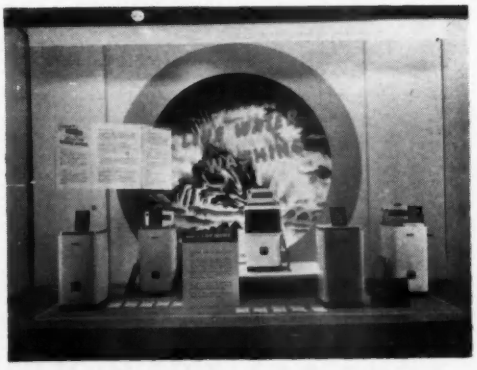
'Important and Active Part'

SIR HAROLD SMITH, Chairman of the Gas Council, wrote: 'It is a far cry to July 29, 1905, when NALGO was founded as a professional association, becoming a trade union in 1920. Its path has not been always an easy one to tread but, perhaps because of this, it has developed under its officers until now it has a membership of 230,000 and contributes to the well-being of its members in many directions outside those which might be said to represent the normal activities of a trade union. I refer to its Benevolent Fund with its expenditure now exceeding £50,000 per annum, its Insurance Company, Building Society, Provident Society, two holiday centres, and two convalescent homes, activities of which it may be justly proud. I have always felt it a great honour to preside over the two Joint Councils with which NALGO is connected so intimately and on which its representatives play such an important and active part.'

MR. F. C. HENFREY-SMITH, General Secretary of the British Gas Staff Association, wrote: 'The British Gas Staff Association sends its sincere greetings to NALGO at its jubilee celebrations. Being one of the younger trade unions, catering solely for blackcoated workers in the gas industry, the B.G.S.A. recognizes and applauds the outstanding pioneer work which has been done through the years by NALGO, especially in the local government service. The experience gained during the life of NALGO was undoubtedly of great benefit when the negotiating machinery for staffs of the nationalised services was being established during the last 10 years. The B.G.S.A. and NALGO take the main responsibility for the negotiation of conditions of service of the staff of the gas industry, and I am happy to be able to state that the two organizations have most cordial relations and unfailingly cooperate to the fullest degree in negotiations with the Gas Council. The Chairman and the National Council of the British Gas Staff Association join me in sending congratulations and best wishes.

DR. G. E. FOXWELL, Secretary and Treasurer of the Gas Officers Guild, wrote: 'The social history of the past century has turned largely on the rights of the individual. No country possesses greater freedom for the individual than Britain within the limits that divide liberty from licence. But we know that the price of liberty is unending vigilance. Never was that more true than today when the big battalions of industry and local government become bigger and more powerful as each decade passes. NALGO has performed yeoman service in upholding the rights of individuals during its half-century of existence. It is equally necessary that the individual should pull his weight in industry and government as a member of the team. To preserve good relations, to encourage men and women to be ambitious and to educate themselves to achieve their ambitions are great and worthy aims. We of the Gas Officers Guild are pleased and proud to work in collaboration with NALGO for these objects and we send to the Association our salutation and our good wishes on this Golden Jubilee.'

'LIVE WATER' AT SELFRIDGES



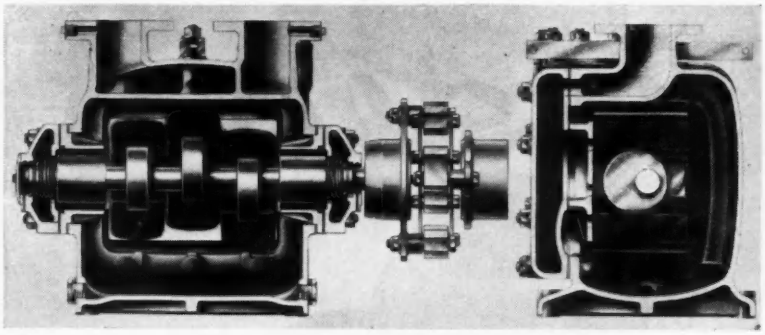
After extensive reconstructional work, Selfridges, Ltd., of Oxford Street, recently opened a new household department. To stimulate public interest in kitchen equipment a washing machine campaign was launched, of four weeks' duration.

From the point of view of the gas industry, it was gratifying to note that although Selfridges had the choice of every washing appliance on the market, they featured the Parkinson 'Live Water' gas-electric washing machine, and provided one of their most prominent windows to exhibit the machine. An attractive 'Live Water' window was arranged displaying also a Perspex model.

Continuous demonstrations were given during the campaign, and several washing machines were used. Each machine illustrated the ease with which particular fabrics may be washed at different temperatures, when gas is used for heating. The results so far obtained have proved most encouraging. In addition to the actual sales and enquiries received during the demonstrations, immense publicity value was achieved from the window display. The success of the campaign must be attributed to the friendly co-operation between Selfridges, Ltd., the North Thames Gas Board, and the Parkinson Stove Co., Ltd.

Our photographs show the 'Live Water' gas-electric washing machine display from two different angles.

TRADE NEWS



Sectional arrangement of Megator GK3 pump.

Wider field for Megator pumps

At a recent Press reception by Megator Pumps & Compressors, Ltd., Sir Maurice Bonham Carter, the Chairman, said that the occasion was notable because it marked the Company's tenth birthday. He said that he had been in at the birth and had been able to follow the remarkable progress that had been made ever since then in the design of pumps by the firm. During the past 10 years the sale of equipment had been devoted principally to the mining and marine industries, but as from the beginning of the second decade the firm would be launching out into many other fields of industry.

Megator pumps are particularly applicable to the gas industry in the pumping of ammoniacal liquids. In this respect much equipment is designed to deal with specific materials without giving sufficient attention to the corrosive action of the contained impurities.

The Megator designers claim, in fact, to have devoted considerable effort to obtaining materials that are sufficiently resistant to all forms of corrosive action; with these they make their pumps. This point was particularly mentioned by L. J. Clark, Development Engineer of the North Thames Gas Board, in his paper 'Pumping of Liquids on Gasworks,' which he presented to the Institution of Gas Engineers last May.

Megator pumps cover capacities from approximately 5 to 300 gal. per minute and operate on the sliding shoe principle. The shoes are made of an extremely hard plastic lined with rubber. They fit over eccentric discs the movement of which provides a vertical displacement to the shoes, thus uncovering the inlet and outlet ports alternately, and a horizontal displacement to the discs themselves which thus act as pistons within the shoes.

The design of the shaft seals, bearings and other mechanical features of the new pumps is very advanced and original development is evident. It is one of the basic characteristics of the sliding shoe mechanism that it does not depend on fine fits or clearances, the working parts being maintained in their correct relative positions by the pressure developed in pumping, which not only ensures a tight seal, but to a great extent compensates for any wear.

The shoes are, in fact, floating on the rotor, and wide variations in alignment are possible without in any way affecting the working of the pump. The shaft seals also permit exceptional radial misalignment. It is therefore possible for the rotor to run with considerable clearance in the bearings without in any way affecting the pump mechanism or the shaft seals.

In the case of direct-coupled pumps, a special coupling has been designed in which radial misalignment is geometrically resolved into readily calculable angular deflection of the rubber bushes that unite the links of the coupling. This coupling has been so devised that it, and the pump end cover and seal, can be removed without having to shift either the pump or the motor.

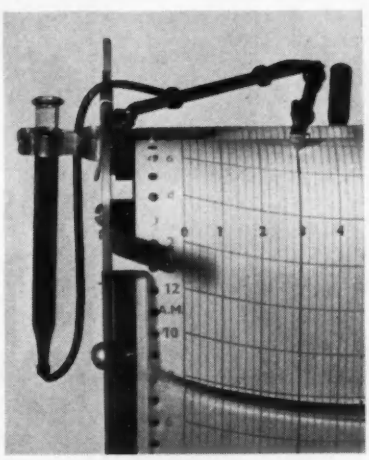
A detail of these pumps that will be appreciated by all concerned with maintenance, is the provision of a simple dismantling arm to facilitate the removal of the front cover for examination of the shoes and other working parts. This provides in a very simple form a means of taking the entire weight of the cover as it is slid on and off the body studs, and of supporting the cover far enough out to permit the easy removal of the shoes and inspection of the pump interior.

It is interesting to note that the Megator K3 pump is said to be able to maintain a head of 350 ft. of water and is used by the fire fighting service. On such services, Megator pumps are particularly useful because, owing to the sliding shoe mechanism, if the suction entry is uncovered the pump will continue to pump air and immediately pick up its water again when available.—*Megator Pumps & Compressors, Ltd., 43, Berkeley Square, London, W.1.*

Line control marker for charts

A provisional patent has been applied for a new invention personally thought out by the Gas Manager of Sigma Instrument Co., Ltd., Mr. L. A. Hedges.

The device is to be known as a 'line control marker,' and is for marking a line on instrument charts to indicate either a control point or a guide to operators.



The new 'line control marker'

In his letter to the Patent Office, Mr. Hedges said that in the past it had been necessary to have special charts printed with this control line marked on them. At the same time, if the control line ever needed to be moved, the chart had to be scrapped, 'and this made it a very costly arrangement.'

The invention enables one to draw a control point at any desired position on the chart, and this can be removed whenever necessary.

To facilitate the initial flow of ink after the glass reservoir has been filled, all that is necessary is to lift it to its upper position. When the ink arrives by gravity at the nib, it is only necessary, for continuous writing, to depress the ink reservoir to its lowest position and the ink will then flow by the capillary tube action.—*Sigma Instrument Co., Ltd., Letchworth, Hertfordshire.*

Metal sheathed carbon tubes

Talbot Stead Tube Co., Ltd., announces the production of 'Metica' tubing which consists of tubes of impervious carbon sheathed in metal. For applications where a high thermal conductivity is required, they recommend impervious graphite, but where strength combined with resistance to corrosion is demanded it is claimed that impervious carbon offers excellent properties. This material, which is easily machinable and offers itself readily to extrusion, is of a

The stars of today...

. . . are created by public acclaim. Cinema audiences acclaim fascinating Diane Cilento, who features in the currently released film "Passage Home"—and housewives acclaim the Century Cooker, which features in thousands of modern kitchens throughout the British Isles. The roles of these two stars in contemporary life are in widely differing fields, but the pre-eminence of both is the result of their fulfilling the exacting demands of their respective roles.

DIANE CILENTO—a star at 21, appears with Anthony Steel and Peter Finch in "PASSAGE HOME"—she is the only girl among 30 men aboard a Merchant ship bound from South America to Britain. The film is a J. Arthur Rank Organisation release, directed by Roy Baker.

Star features of the CENTURY

★ Vitreous enamelled surfaces throughout
★ Cream exterior
★ Removable double platerack
★ Used oven heat vented in front of backplate to heat platerack
★ Four fast-boiling hotplate burners with fixed stop for simmering
★ Large quick-heating grill
★ Safety-type taps ★ Hotplate parts removable ★ Roomy oven—base suitable for slow cooking
★ Mainstat controls oven temperature ★ Drop-type oven door
★ Oven lights from front by flash tube ★ Storage space in plinth
★ Hotplate side extensions and gas lighter supplied if required

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CENTURY

Cooker

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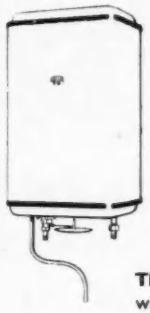
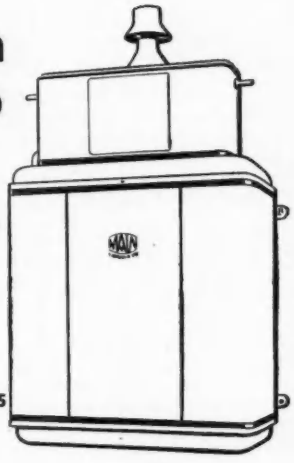
constant hot water . . .



for the sink or wash basin . . .

The Thermain No. 2
with 2 gallons capacity. Finished in cream or white enamel and with black decoration.

or from any tap in the house..



The Thermain No. 15 Multipoint
with 15 gallons capacity. Finished in white or cream enamel paint.

from MAIN storage water heaters

. . . There's one for every domestic purpose

MAIN WATER HEATERS LTD.
Gothic Works, Thornton Road, Croydon, Surrey

W32

very brittle nature and can be broken by even dropping it or by accidentally tapping it with a hammer while *in situ*. The company, however, claims that it has perfected the process of covering tubes with a metallic sheath to meet operating conditions. This external metal might be carbon steel, alloy or stainless tubing, or some other material such as copper, brass, etc.

Applications for 'Matica' tubing include conveyance of hot chlorinated solvents, hot hydrochloric acid, hot dilute hydrofluoric acid (up to 55 to 60%), and corrosive solvents associated with the oil refinery industry. Metal protected tubing is claimed to be safe in all cases. The accidental breaking of a carbon tube would be very expensive, from the loss of the pipe and fluid apart from the considerable danger that may be involved. It is claimed that higher temperatures and pressures will be possible. These carbon and graphite tubes are made to standard sizes from nominal inside diameters of $\frac{3}{8}$ in. to 4 in. The standard length is 6 ft. For sizes other than standard very careful consideration would have to be given. The thickness of the metal sheath can be amended to suit individual requirements. Methods of joining the pipes together with tees and elbows have been devised. — *Talbot Stead Tube Co., Ltd., Green Lane, Walsall.*

Foxboro 'Stabilflo' valves and the 'Vernier Valvactor'

Foxboro-Yoxall, Ltd., announce that their range of 'Stabilflo' valves are now being supplied ready drilled to take the type CYSG3 'Vernier Valvactor.' The drilling provides for direct mounting of the Valvactor on the yoke of the valve to ensure complete rigidity. The Stabilflo D.8 valve illustrated here has the standard Stabilflo 2-100% logarithmic characteristic and is fitted with the type CYSG3 Valvacator, designed for use when difficult conditions may make the precise positioning of the controlled valve uncertain or even impossible.

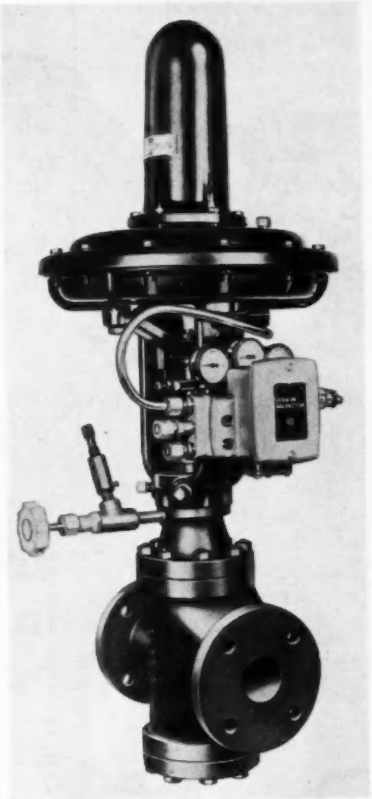
It overcomes these conditions and ensures accurate positioning of the valve plunger by utilizing the full operating air supply pressure in response to even the slightest signal change from the controller. Its sensitivity is such that it will respond to a pressure of less than 1 in. of water.

The type CYSG3 is said to be of particular value in the following circumstances: (a) Where wide proportional bands and slow rates of reset are used in the controller; (b) in overcoming friction caused by icing, gumming, high viscosity, sedimentation, or when the use of tight packing is imposed by high pressures or toxic fluids; (c) for stabilizing the plunger position when unbalance results from fluctuating line pressures.

A principal feature in the construction of the type CYSG3 is its extreme simplicity of design. The few moving parts are compactly grouped in a weatherproof case and are easily accessible. No hairsprings are used, and the Valvactor is unaffected by vibration.

Adjustment to suit the stroke of any Foxboro valve is made by two simple movements which will also reverse the action. Where a process is continuous and no interruption of the flow is possible, three air pressure gauges and a by-pass switch allow the Valvactor to be instantly isolated and withdrawn for inspection while the valve continues to be operated either manually or directly from the controller.

The Valvactor is particularly suited to duplexing and sequencing when its extreme sensitivity allows numerous valves



Foxboro 'Stabilflo' valve with the type CYSG3 'Vernier Valvactor'

to be accurately positioned over the span from one controller, and the simple adjustment permits the setting of the valves to be carried out with unusual ease and speed.

For applications where the process is not continuous the type GYOG1, with one air supply pressure gauge and no transfer switch, should be used.— *Foxboro-Yoxall, Ltd., Lombard Road, Merton, London, S.W.19.*

Clothes-drying hangers

The importance of adequate storage facilities for wet clothes is well-known in industry. The 'Sieber' 'All-in-one' and air-drying systems of hanging clothes are already well-established in factories and schools, hospitals, etc. Rain-soaked or otherwise wet garments are correctly hung and spread out on these patented hangers, to ensure a free flow of air around and through the clothing. This permits their airing and drying at the same time retaining the shape and prolonging the life of wearing apparel. 'Sieber' hangers can also provide a place for all items of clothing from the hat to the shoes, in a simple and orderly manner.

The 'Sieber' standard hanger, weighing approximately 4 lb., is constructed of rod, electrically welded at all joints, and rust proofed. A refinement of this is the locking basket hanger, the basket at the bottom of which can contain valuables and be locked. A well-known Birmingham factory have a single-tier installation with hot water heating pipes, running parallel with the racks, beneath the hangers.—*James Sieber Equipment Co., Ltd., Africa House, Kinsgway, London, W.C.2.*

TRADE PUBLICATIONS

Heat insulation

Hurseal, Ltd., 229, Regent Street, London; W.1, have published leaflets entitled *Comfort with Safety and Economy, Fitting the Hurdapta*, and *Heat Insulation by Hurseal.*

Mud hog crushers

A leaflet recently produced by British Jeffrey-Diamond, Ltd., 15-17, Caxton St., London, S.W.1, gives information concerning their heavy duty single direction and reversible, and light duty single direction mud hogs.

Automatic anti-freeze

Thomas Dryden & Sons, Ltd., of Grimshaw Street Foundry, Preston, a constituent company of the Oxley Engineering Co., Ltd., have issued a pamphlet giving details of the Dryden automatic electrical anti-freezing equipment for gasholders.

Silica refractories

General Refractories, Ltd., Genefax House, Sheffield 10, have published a booklet in which is described their plant for the manufacture of the new Densyl brick. Its title is *An Outstanding Achievement in Silica Refractories.* An outline of the research that led up to the production of the new brick, some descriptions of its possible applications, and a table of its chemical and physical data are included.

Aluminium usage

The Northern Aluminium Co., Ltd., have reprinted in book form a series of articles on the techniques of working with aluminium by one of their development engineers, Mr. H. Hinxman. The ten chapters, copiously illustrated in this 64-page book, entitled *The Forming of Aluminium Sheet*, deal with the characteristics of the metal, and its manipulation in bending, spinning, deep drawing, pressing, stretch-forming, hand forming, blanking, piercing and various supplementary operations. All are illustrated by examples from actual practice, which are described in detail.

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ARE NOT ONLY SECURE-
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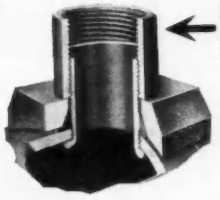
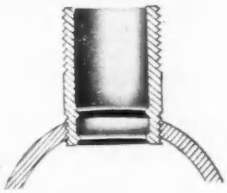

Parkinson Nipple with gutta-percha ring and C.I. saddle piece for steel mains.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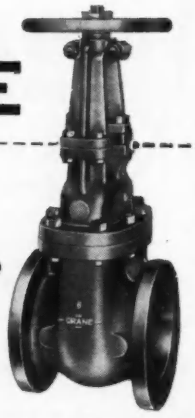

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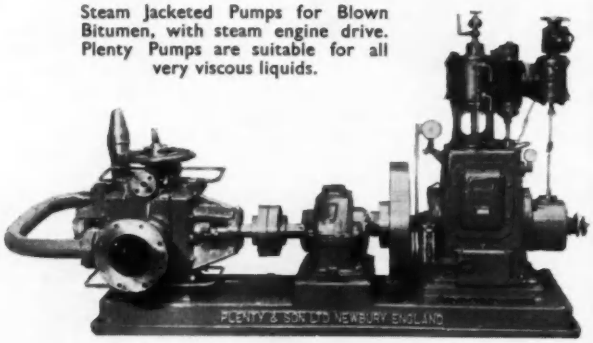
Steam Jacketed Pumps for Blown Bitumen, with steam engine drive. Plenty Pumps are suitable for all very viscous liquids.



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APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

EAST MIDLANDS GAS BOARD

NOTTS & DERBY DIVISION
DERBY UNDERTAKING—LITCHURCH WORKS
APPOINTMENT OF WORKS CHEMIST

APPLICATIONS are invited from suitably qualified persons for the position of Works Chemist at the Litchurch Gas Works, Derby, at a commencing salary within APT. 9 (£700/£800) according to age, qualifications and experience.

Applicants should have a sound knowledge of the chemical control of gas manufacture and be experienced in the carrying out of the usual gas works tests.

The position is pensionable and the successful applicant will be required to pass a medical examination.

Applications, stating age and giving details of education, qualifications and experience, together with the names of two referees, should be addressed to the undersigned not later than Friday, August 26, 1955.

K. L. PEARCE,
Divisional General Manager.

East Midlands Gas Board,
Notts and Derby Division,
P.O. Box No. 62,
Friar Gate,
Derby.

EAST MIDLANDS GAS BOARD

NOTTS & DERBY DIVISION
APPOINTMENT OF HOME SERVICE ADVISORY STAFF

APPLICATIONS are invited for vacancies which have arisen for Home Service Advisers in the following Districts:—

Burton-upon-Trent.
Chesterfield.
Heanor.
Newark.

The salary will be within the range £338/494 per annum.

Candidates must be capable of working independently and be in possession of a recognised diploma in cookery and/or domestic science. They should be proficient in the practical demonstration of gas cooking, laundering and other appliances and be able to advise consumers on domestic problems involving the use of gas in the home.

The posts are pensionable and the successful applicants will be required to pass a medical examination.

Applications stating age and giving details of education, qualifications and experience, together with the names of two referees should be addressed to reach the undersigned not later than Friday, August 26, 1955.

Applicants should state for which District they wish to be considered for employment.

K. L. PEARCE,
Divisional General Manager.

East Midlands Gas Board,
Notts & Derby Division,
P.O. Box No. 62,
Friar Gate,
DERBY.

SOUTH EASTERN GAS BOARD

TECHNICAL ASSISTANT
DISTRIBUTING ENGINEER'S DEPARTMENT,
SUSSEX DIVISION, 77, WEST STREET, BRIGHTON

CANDIDATES must have obtained one of the following Certificates:—

(1) Higher Grade Certificate in Gas Engineering (Supply) of the Institution of Gas Engineers;

(2) Higher National Certificate in Mechanical Engineering;

and should preferably have had Distribution Drawing Office and Mainlaying experience.

Salary within Grade 7 (Provincial 'A')—£620-£700 p.a.

Applications in writing, quoting reference V10/558 and giving full details, should reach the undersigned not later than 14 days after the publication of this notice.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

NORTH WESTERN GAS BOARD

LIVERPOOL GROUP
SENIOR DRAUGHTSMAN

APPLICATIONS are invited for the above pensionable post in the Distribution Drawing Office of the Liverpool Group.

The salary will be within Grades APT. 7/8 (£620/£740 per annum), according to qualifications and experience. Applicants must be qualified draughtsmen and experience in structures and pipe layout would be an advantage.

Application should be made on the official form obtainable from the Chief Personnel Officer, N.W.G.B. (Liverpool Group), Radiant House, Bold Street, Liverpool, 1, and returned to him within 14 days.

EAST LANCASHIRE GROUP

Applications are invited for the following pensionable appointments at Greenbank Works, Blackburn and Oswald Street Works, Burnley:—

1. CHEMISTS—Grade APT 7 (£620/£700 per annum).

Applicants must be experienced in the carrying out of routine laboratory tests and be able to exercise chemical control of gas manufacturing and product processes. The possession of a recognised qualification in applied chemistry will be an advantage.

2. TECHNICAL ASSISTANTS (Production)—Grade APT. 7 (£620/£700 per annum).

Applicants should have experience in the technical control and operation of gasworks plant and processes, with particular reference to Vertical Retorts and C.W.G. plants. The successful applicant will work under the direction of the Carbonising Superintendent.

3. LABORATORY ASSISTANTS—Grade APT 3 (males £365/£535 per annum—females £298/£434 per annum).

Applicants should preferably have some chemical laboratory training. Education up to the Ordinary National Certificate standard in chemistry subjects would be an advantage.

Detailed applications, giving the names of two referees and indicating the works at which employment is preferred, should be sent to the General Manager, N.W.G.B. (East Lancashire Group), Cardwell Place, Blackburn, within 14 days.

SOUTH WESTERN GAS BOARD

CHELTENHAM DIVISION
CHELTENHAM WORKS
APPOINTMENT OF SENIOR WORKS CHEMIST

APPLICATIONS are invited for the position of SENIOR WORKS CHEMIST at the Cheltenham Works. Applicants should be familiar with all Gas Works Chemical Tests and the Chemical Control of Plant. Possession of the Higher National Certificate in Chemistry or equivalent qualification is desirable. Salary will be within Grade APT.8—£660-£740.

Applications should be sent to O. H. W. Boonham, Esq., Production Engineer, Cheltenham Division, Gloucester Road, Cheltenham, by August 20, 1955.

WALES GAS BOARD

DOMESTIC SALES AND SERVICE OFFICER

APPLICATIONS are invited for the post of DOMESTIC SALES AND SERVICE OFFICER for South and Central Wales.

Applicants must have organising and administrative ability. General commercial experience, either in the gas industry or in other large-scale organisations, will be of advantage.

The commencing salary will be £1,500 per annum. The post is pensionable and the successful applicant will be required to undergo a medical examination.

Applications stating age, qualifications and experience, together with the names of two referees, should be received by the undersigned not later than first post on Monday, August 29, 1955.

C. B. MAWER,
Secretary to the Board.

2, Windsor Place,
Cardiff.

WALES GAS BOARD

GENERAL MANAGER
NEWPORT UNDERTAKING

APPLICATIONS are invited for the position of GENERAL MANAGER of the Newport Undertaking.

Candidates for the appointment, which will carry a salary of £2,075 per annum, must have had wide administrative experience and possess appropriate qualifications.

Applications stating age, qualifications and experience, together with details of present and previous appointments and names of two referees, should be received by the undersigned not later than September 1, 1955.

C. B. MAWER,
Secretary to the Board.

2, Windsor Place,
Cardiff.

WALES GAS BOARD

ASSISTANT INTERNAL AUDITOR—WEST WALES

APPLICATIONS are invited for the above position, the salary for which will be in accordance with Grade D. £575/650 per annum, of the scales agreed by the National Joint Council for Gas Staffs. The post is pensionable.

The West Wales Internal Auditor covers the Swansea, Mid Glamorganshire, Carmarthenshire and Pembrokeshire Groups. The person appointed will be required to work under his supervision, and to reside in the Swansea district, at which Undertaking the Internal Auditor is based. The duties involved will necessitate a great deal of travelling and absence from base when visiting the more distant undertakings in the Groups mentioned.

Candidates should hold a recognised accountancy qualification and have some experience of the internal audit and/or accountancy work in the gas industry.

The successful applicant will be required to pass a medical examination.

Applications giving full details of qualifications and experience, together with the names of two referees, should be sent to the Chief Accountant, 2, Windsor Place, Cardiff, not later than August 27, 1955.

WALES GAS BOARD

TECHNICAL ASSISTANT (ENGINEERING)
PONTYPOOL UNDERTAKING

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT (ENGINEERING) to the Pontypool Undertaking.

Applicants must have had a good Drawing Office experience and be able to prepare works layout, pipe work and steel work details. Experience with a Contractor and/or technical knowledge of Gasworks processes will be an advantage. Possession of the Higher Grade Certificate in Gas Engineering or equivalent qualification will be an advantage.

The commencing salary will be within Grade APT. 7 (Provincial 'A') (£620-£700) per annum of the National Salary Scale for Gas Staffs. The post is pensionable.

The successful candidate may be required to pass a medical examination.

Applications stating age, qualifications and experience, together with details of present and previous appointments and the names of two referees, should be received by the undersigned not later than August 18, 1955.

A. FACER,
General Manager.

Gas Offices,
Hanbury Road,
Pontypool, Mon.

(*Classified advertisements continued on page* 406)

APPOINTMENTS VACANT (ctd.)

SCOTTISH GAS BOARD

WESTERN GROUP
DUNOON DISTRICT
APPOINTMENT OF DISTRICT MANAGER

APPLICATIONS from qualified Gas Engineers are invited for the position of DISTRICT MANAGER of the above-named Undertaking.

Applicants shou'd be Corporate Members of the Institution of Gas Engineers or hold equivalent qualifications, and should have practical experience in the control and operation of Vertical Retorts and in Administration.

The salary offered is in accordance with the Board's Scale of Salaries, Provincial 'B' APT. XI (£770-£895) with placing according to qualifications and experience, plus free house and fuel allowance equal to 400 therms per annum.

The successful candidate will require to pass a medical examination and will be subject to the provisions of the Board's Superannuation Scheme.

Applications, endorsed "District Manager—Dunoon," giving age and full details of qualifications, training and experience, together with the names of two referees, shou'd be lodged with the undersigned on or before Saturday, August 20, 1955.

ALEX. JAMIESON,
Group Manager.

'Kessington,'
29, Union Street,
Greenock.

NORTH EASTERN GAS BOARD

BRADFORD GROUP
GROUP INDUSTRIAL ENGINEER

APPLICATIONS are invited for the position of GROUP INDUSTRIAL ENGINEER at a commencing salary of not less than £1,000 per annum.

Candidates should be experienced in the design and installation of industrial plant. Possession of a qualification in fuel technology is essential and a degree in engineering would be an advantage. The successful applicant will be responsible to the Group General Manager for all matters relating to the supply and utilisation of gas for industrial purposes, and will direct the activities of the Industrial section for providing consumer service and in developing the industrial gas load.

The successful applicant will be required to pass a medical examination and to join the Board's Staff Pension Scheme.

Applications stating age and giving full details of qualifications and experience should be sent to C. A. Newham, Esq., Group General Manager, North Eastern Gas Board, Bradford Group, Britannia House, Bradford, to arrive not later than August 17, 1955.

J. C. GARDNER,
Secretary.

Bridge Street,
Leeds, 2.

NORTHERN GAS BOARD

ASSISTANT MANAGER—EAST COAST GRID

APPLICATIONS are invited from suitably qualified persons possessing experience in Production and Transmission of gas on a large scale. Ability to prepare operational programmes is essential, and some experience in handling bulk supplies of Coke Oven Gas would be advantageous. Salary dependent on age and qualifications will be up to £1,000 per annum.

The successful applicant will be required to pass a medical examination, and to join the Board's Staff Pension Scheme.

Applications, stating age, experience and qualifications, should be sent to the Secretary, Northern Gas Board, 30, Grainger Street, Newcastle-upon-Tyne, 1, not later than August 31, 1955.

NORTHERN GAS BOARD

(TYNESIDE DIVISION)

APPLICATIONS are invited for the post of SHIFT ENGINEER at the Howdon Works of the above Division.

The appointment will be within Grade APT. 6 (£565-£645 per annum) of the National Salary Scales for Gas Staffs.

Applications stating age, experience and qualifications should be addressed to the undersigned within fourteen days of this advertisement.

W. SUTCLIFFE,
Divisional General Manager.

30, Grainger Street,
Newcastle-upon-Tyne, 1.

NORTHERN GAS BOARD

(TYNESIDE DIVISION)

TECHNICAL ASSISTANT (PURIFICATION)—REDHEUGH WORKS

APPLICATIONS are invited from suitably qualified persons for the above position.

Applicants should have had a wide experience of modern gas purification practice and will be responsible to the Works Manager for the control of purification plant having a total capacity of 40 million cubic feet per day.

The appointment will be within Grade APT. 10 (£760-£860 per annum) of the National Salary Scales for Gas Staffs.

The successful applicant will be required to pass a medical examination and be subject to the Board's Pension Scheme.

Applications stating age, experience, qualifications and giving the names of two referees should be addressed to the undersigned within fourteen days of this advertisement.

W. SUTCLIFFE,
Divisional General Manager.

30, Grainger Street,
Newcastle-upon-Tyne, 1.

EASTERN GAS BOARD

WATFORD DIVISION
APPOINTMENT OF INDUSTRIAL REPRESENTATIVES AND COMMERCIAL REPRESENTATIVES

APPLICATIONS are invited from those interested in the above appointments, of which there are a number to be made in the Southern and the Northern Sections of the Division.

Industrial Representatives will be required to advise and assist Industrial consumers using gas in a wide variety of applications and to use all their efforts to expand gas sales. Commercial Representatives will be expected to carry out similar duties in connection with commercial usage.

All applicants should possess the qualifications and experience to prepare schemes and estimates and conduct business with representatives of industry and commerce, Architects and Surveyors.

In special cases training will be given to employees who possess some but not all of the qualities necessary for these appointments. The commencing salaries for trained personnel will be as follows:—

Industrial Representatives—in the range APT. 8 and 9 (£680/£820 per annum, Fringe Metropolitan).

Commercial Representatives—in the range APT. 7 and 8 (£640/£760 per annum, Fringe Metropolitan).

The successful candidates may be required to pass a medical examination and, unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required, if eligible, to join the Board's Staff Pension Scheme within six months of taking up the appointment.

Applications giving full details of education, training and experience should be forwarded to the General Manager, Eastern Gas Board (Watford Division), Radiant House, Clarendon Road, Watford, to arrive not later than September 3, 1955.

DRAUGHTSMAN required, preferably experienced in Gas Engineering. A.E.S.D. rates paid. Write giving full particulars of experience and training to W. C. Holmes & Co., Ltd., 119, Victoria Street, Westminster, S.W.1.

PLANT FOR SALE

FOR SALE: NEW GAS-FIRED BOILER by Hartley & Sugden. 160 lbs./hour at 80 lbs. p.s.i., complete with chimney, spare burner and controls. Original purchase price was £419. Our price £200. W. H. COLLINGBOURNE & CO., LTD., 1481, Stratford Road, Birmingham, 28. Phone: Shirley 3303.

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Standard A.C. supply. Squirrel cage. Star connected. Continuously rated. Speed 2950 r.p.m. Makers, M-V. FLP cert. No. 650.

One	20 H.P.	No. 24505—F.
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Three	7 H.P.	Nos. 24507—F1, F2, F4.
Three	6 H.P.	Nos. 24508—F2, F3, F5.
Two	5 H.P.	Nos. 24509—F1, F2.

Inspection Invited. Apply:-

H. COBBOLD, 22, Kings End, Ruislip
(Tel. 5829)

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GAS ACCOUNT CALCULATORS

SUPPLIED either by Price per Therm or Thousand, for any specified Calorific Value, in book form, office charts, or pocket charts for Meter Inspectors, printed in clear type. Write for particulars to F. H. WAKELIN, LTD., Calculator Specialists, 354, WHEELER STREET, BIRMINGHAM.

'Phone: Northern 0989. 'Grams: Reckoners, B'ham.

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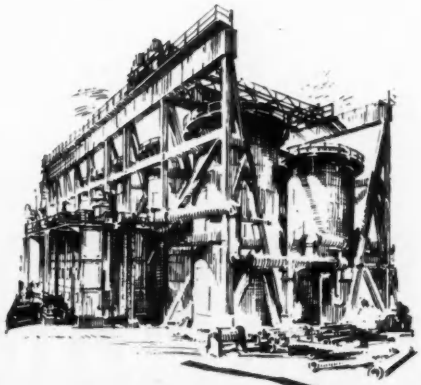
On neighbourliness

Up this morning early and in Mr. Hunt's garden his new maidservant singing mighty tuneful at her work, she being a pretty wench. I called her having a notion to give her money for ribbons but not to have the poor creature take a wrong idea of me did change my mind and gave her a kiss which my wife observing she did rate me soundly.

Lord, the degree of misunderstanding that I did incur on account of a little forgivable levity.

(*As Samuel Pepys might have written*)



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for accurate control of air blast systems

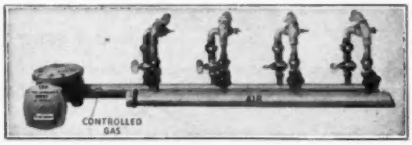
The Type 3 is the latest development in mixture controllers. Its function ensures exact proportioning of air and gas over a wide range of volumes despite the slightest variation of pressures.

Air pressures between ¼ lb. and 1 lb. are used normally but in special instances up to 2 lb. can be used.

Of robust unit construction, the assembly consists of a diaphragm valve, monitor governor and an injector which can be set in any one of four standard positions on site.

The Type 3 mixture controller is available in four sizes 1", 1¼", 1½" and 2". Write or 'phone now for particulars.

The Type 3 zero governor is a modification of the controller. Providing individual control of burners, it gives greater effective control of heat distribution, facilitates burner ignition and has greater sensitivity and range than previous types.



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If air blast arrangements are not already installed a K.B. High Pressure fan will provide, as a rule, greater efficiency and economy than a positive blower or compressor of equal capacity. These fans may be supplied with or without K.B. made motors as required.

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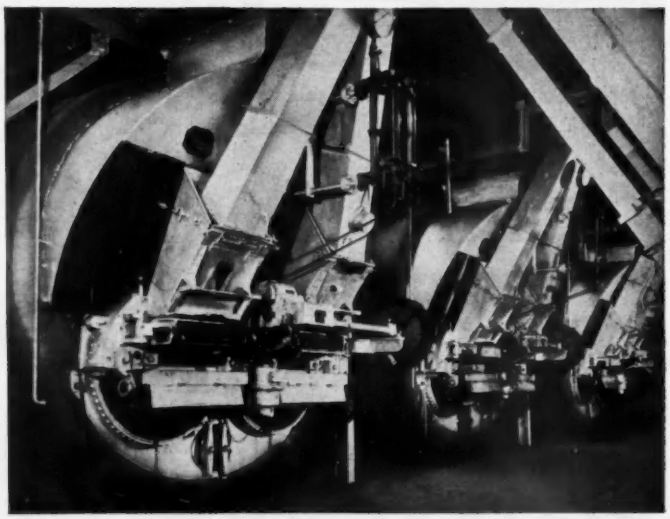

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SYSTEMS

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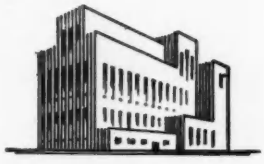

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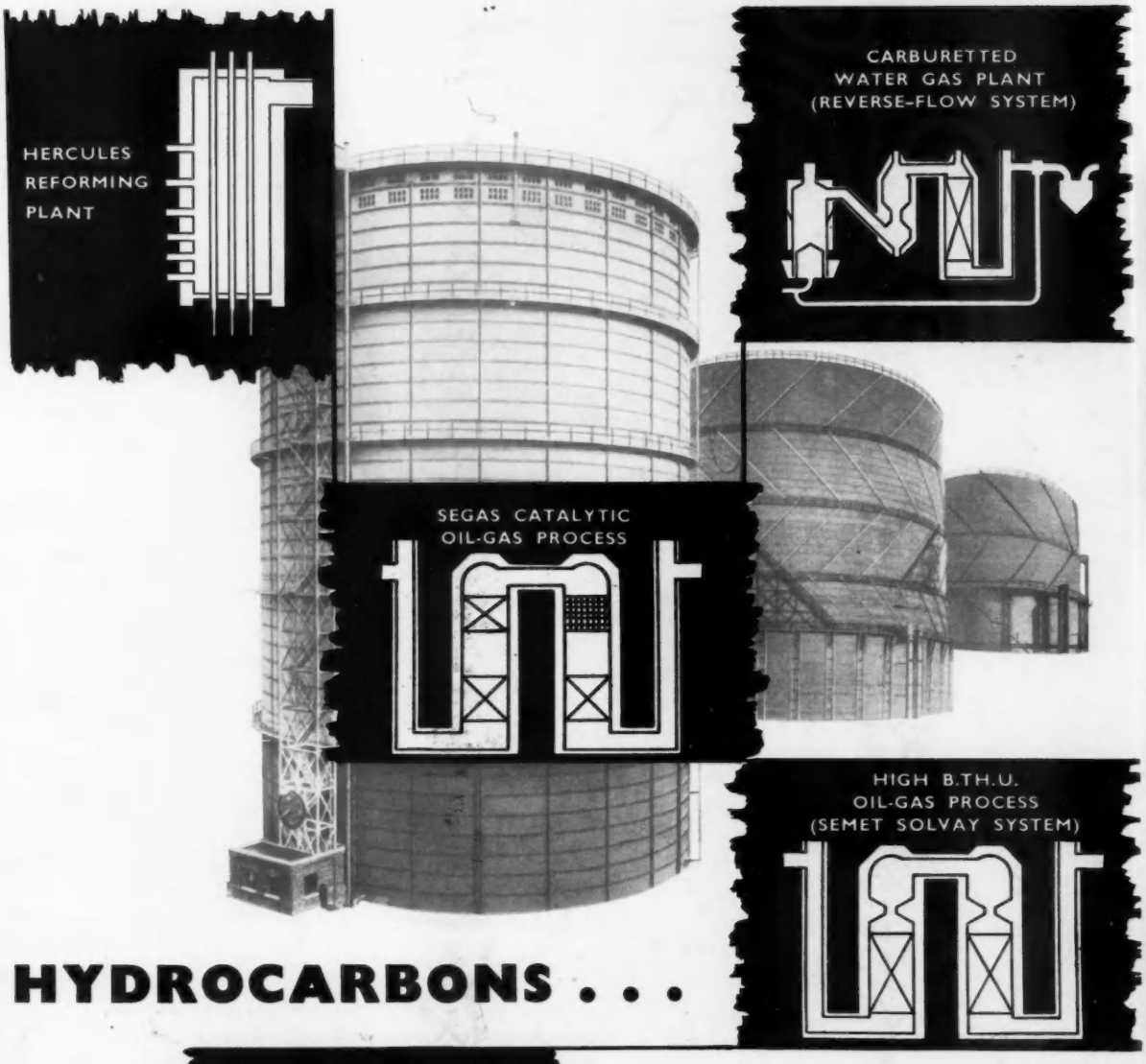

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214

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